


7-9

Pros and Cons of Cotton Production in Uzbekistan

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Executive Summary

Cotton production and export have a long history in Uzbekistan. The production of cotton, also called “white gold,” has long been a strategic centerpiece of the economy of Uzbekistan, which ranks second among world cotton exporters. Despite the declared objective of the Government of Uzbekistan—a market-oriented transition and liberalization—the government has not loosened its grip on the entire cotton value chain, including the centralized setting of prices through the state procurement system. This system focuses on implicit taxation of cotton producers, which represents an important source of government revenue. Annual cotton production targets set by the state call for cotton cultivation on more than 50 percent of total cropland.

This case study considers the pros and cons of cotton production in Uzbekistan. Since the country’s independence from the Soviet Union in 1991, revenues from cotton taxation have contributed substantially to developing the industrial sector, boosting the current account, achieving energy and food-grain self-sufficiency, and buffering domestic shocks in food and energy prices. Nonetheless, some argue that the state procurement system hampers the development of the agricultural sector. Often the payments for cotton hardly cover farmers’ production costs, and the quasi monoculture of cotton production has adversely affected environmental sustainability.

The stakeholders of cotton production in Uzbekistan—the government, farmers, the textile industry, and the rural population—face several policy options for improving the economic and ecological performance of cotton production. The concerns of each stakeholder must be taken into account when choosing what policy measure to use for improving cotton production.

Your assignment is to recommend to the relevant stakeholders an appropriate policy or set of policies to ensure economic growth in the cotton sector, taking into account the trade-offs between the state and farmers as well as potential short- and long-term effects of recommendations on the national economy, social security, and the environment.

Background

Uzbekistan, one of five countries in Central Asia, was the fifth-largest country in the former Soviet Union (FSU) and is the second-largest country in Central Asia. With an area of 447,400 square kilometres (km²), it is slightly larger than California and about the same size as France. Uzbekistan is one of only two double-landlocked countries in the world (Liechtenstein is the other).¹ With 27 million people in 2006, Uzbekistan has the third-largest population of the 15 countries created after the breakup of the FSU.

Agriculture forms the backbone of Uzbekistan’s economy. This sector has long been a source of transfers from which the rest of the economy benefits. Of the total area, only about 10 percent is arable cropland, located mainly in the river valleys of the Amu Darya and the Syr Darya. Although small in area, these croplands produced 28 percent of gross domestic product (GDP) and 25 percent of national exports in 2008. About 60 percent of Uzbekistan’s population lives in rural areas, and about 44 percent of the total labor force is employed in agriculture. Uzbekistan has an arid climate and is noted for its abundance of solar radiation, low cloudiness, poor atmospheric precipitation, and high evaporation—factors that make irrigation indispensable for agricultural production.

Cotton production and export have a long history in Uzbekistan. According to historical evidence, cotton has been cultivated in what is now Uzbekistan since the 5–6th centuries (Rudenko 2008). Today, the production of *Gossypium barbadense* L. and *G. hirsutum* L. (Ibragimov et al. 2008) has a high economic priority (Müller 2006). Uzbekistan is the world’s fifth-largest cotton producer among 90 cotton-growing countries. It produces about 1 million tons² of cotton fiber annually, which accounts for almost 6 percent of global cotton production. Moreover, during 2003–07 Uzbekistan exported 4.447 million tons of cotton fiber (equivalent to 11 percent of world exports) and was the second-largest exporter in the world after the United States. Cotton generated 13 percent of Uzbekistan’s GDP and accounted for

¹ A double-landlocked country is a landlocked country bordered only by other landlocked countries so one must cross at least two borders to reach a coastline.

² All tons in this case study are metric tons, unless otherwise noted.

almost 30 percent of rural employment (Rudenko, Lamers, and Grote 2009). Cotton exports contributed to about 25 percent of Uzbekistan's foreign exchange revenues (Guadagni et al. 2005).

History of Cotton Production in Uzbekistan

The Tsarist Era: 1860–1917

Before 1860, the cotton belt region of the United States was the main supplier of cotton fiber to tsarist Russia. The U.S. Civil War hampered this export channel, and Russia sought alternatives to satisfy its cotton demand. Starting in the 1860s, tsarist Russia penetrated Central Asia because of its favorable climatic conditions and geographic location. As part of the “Great Game” between the British and Russian Empires (Spoor 1993), railroads were constructed between main cities and commercial centers in Central Asia and Russia. This construction inaugurated an era of regional specialization, and the small independent states covering modern Uzbekistan—the Kokand and Khiva khanates and the Bukhara Emirate—were forced to become the main suppliers of cotton to Russia. To increase cotton yields and improve its quality to meet the requirements of the Russian textile industry, *G. Gipsitum* varieties were imported from Central America (Rudenko 2008). In addition, the cotton area was expanded from 35,000 hectares (ha) to 441,600 ha, and the yield of raw cotton increased from 0.7 ton per ha to 1.2 tons per ha between 1860 and 1913 (Spoor 1993; Pomfret 2002). The expansion in cotton area, which came at the expense of area sown to cereals, was due to the forced cultivation of cotton rather than to producers' reaction to improved terms of trade. In the late 19th and early 20th centuries, one-third of total irrigated land in Central Asia was devoted to cotton production. Cotton was grown on the more fertile soils, whereas cereal cultivation occurred on less fertile soils.

The Soviet Era: 1920–91

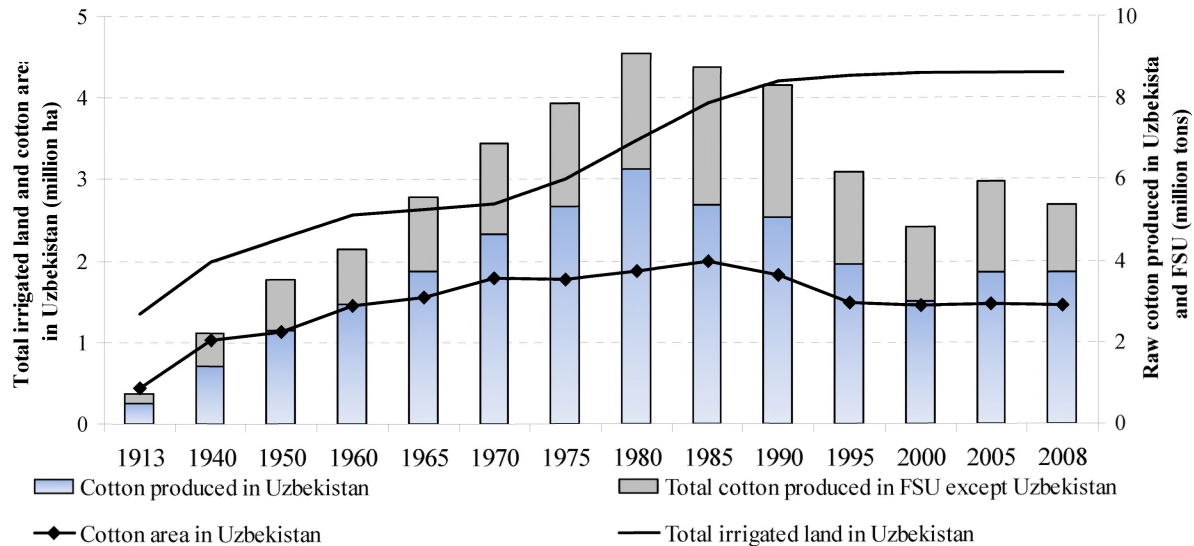
Following the 1917 Bolshevik revolution in Russia, Central Asia became a part of the FSU. In 1924, the Uzbek Soviet Socialist Republic (UzSSR) was declared, with borders more or less matching those of current Uzbekistan. During the Soviet era, the

central government regulated agricultural production and input and output prices. In addition, all supporting services for agricultural production, such as input distribution, agro-processing, and trade, were state owned and closely linked to the state procurement system (Spoor 1999).

The government of the FSU pursued cotton self-sufficiency and foreign exchange earnings much more than tsarist Russia had, and cotton was declared the “white gold” of Central Asia. Soviet investments in the UzSSR were almost exclusively oriented to the massive expansion of cotton production: between 1913 and 1940 Uzbekistan's cotton area increased from 441,600 ha to 1,022,600 ha (Figure 1). To increase cotton yields further, the FSU government pursued the intensive use of machinery, fertilizers, and pesticides and the use of improved cotton varieties. Whereas before the 1860s, what was then Uzbekistan had supplied less than 10 percent of Russia's cotton, from the 1930s onward the FSU became self-sufficient in cotton and even became an exporter in the 1950s (Pomfret 2002).

In the 1960s, a new wave of massive expansion of cotton in the UzSSR was triggered by a specially designed irrigation program. Cotton area in the UzSSR increased by 23 percent in the 1960s and 1970s and reached almost 2,000,000 ha in the early 1980s. After 1960 the land devoted to cotton constituted about 61 percent of arable land, and the level of specialization was greater than elsewhere in the FSU. Yields increased rapidly, and by the mid-1970s, official Soviet sources reported that raw cotton output in Uzbekistan was 3 tons per hectare—the highest yield among all major producers at that time. Output reached 4.6 million tons of raw cotton in 1970 and more than 5 million tons in 1980—10 times the output of 1913. Cotton became the engine of the economy of the UzSSR, which produced more than two-thirds of all Soviet cotton. As in the tsarist period, however, little attention was devoted to developing the entire cotton value chain in the UzSSR, and processing facilities and opportunities inside the country were not pursued. Uzbekistan remained purely a supplier of cotton fiber, which was processed by the textile industries in Russia and Eastern Europe. Cotton fiber was thus transported several thousand kilometers for processing, and ready-made textiles were then transported back to the UzSSR.

Figure 1: Cotton Production in Uzbekistan and the FSU, 1913–2008



Sources: Spoor 1993; Pomfret 2002; FAO 2010.

The Transition Period: 1991–Today

When Uzbekistan became a sovereign state in 1991, the share of agriculture in GDP was greater than 33 percent, followed by the industrial sector with 27 percent. Concurrently, financing from the central FSU government ceased, and the Government of Uzbekistan (GoU) sought its own ways of generating revenue. Yet the former dependence relationships could not be easily replaced by the anticipated focus on market-oriented production and international trade. A gradual market-oriented reform was introduced, and Uzbekistan has since pursued an “Uzbek model” of transition from state socialism to a market-based economy (Zettelmeyer 1999). This model consisted of a gradual reform designed to cushion the economic and social impact of the dramatic changes associated with the dissolution of the FSU as experienced elsewhere (Pomfret and Anderson 1997). The agricultural reforms sought to maintain foreign exchange revenues from exports (Rudenko 2008) because cotton brought Uzbekistan greatly needed hard currency. Following independence, the state procurement (SP) system remained a centerpiece of the national strategy largely because the national budget depends on revenues from the implicit taxation of the entire cotton sector (Guadagni et al. 2005) through production targets and determined

procurement and input prices (Pomfret and Anderson 1997). Despite its relatively high place in world export and production rankings, Uzbekistan is a price-taking country in the international cotton fiber market, and the GoU exports cotton irrespective of the level of the world market price.

Despite its achievements in cotton production and export earnings, Uzbekistan’s strict focus on the export of a single commodity, cotton fiber, makes the country vulnerable to world price fluctuations, particularly during periods of depressed world prices or dampened demand for cotton. On the other hand, Uzbekistan’s economy benefits from increased world market prices for cotton as occurred in 2003/04 and 2007/08. In the aftermath of independence, the input and output trade arrangements between Uzbekistan and other FSU countries became unreliable and were plagued by nonpayment by the FSU republics. Gaining self-sufficiency in energy became a declared priority of the GoU, which pursued a strategy of diversifying economic output away from agriculture and raw materials and toward the industrial sector. As part of this strategy, resources stemming from cotton and gold sales were used to develop import-substituting industries such as wheat cultivation and processing and oil refining (Rosenberg, Ruocco,

and Wiegard 1999). With the gradual diversification of the export sector, the share of cotton in national export earnings decreased and at present is exceeded by gas and gold sales. Nonetheless, the production targets and state-determined cotton prices remain a bedrock of the cotton value chain, and more than 50 percent of total cropland in Uzbekistan is still allocated to cotton production annually (Müller 2006).

Policy Issues

The State Procurement Mechanism

The market for cotton in Uzbekistan (Box 1) can be expressed in a simplified partial equilibrium model as suggested by Pomfret (2008). Since independence, the GoU has managed the national cotton market and purchased raw cotton from farmers at a centrally set SP price (Müller 2006). A centerpiece of this state-ordered form of production is farmers' fulfillment of the targets set by the GoU. For instance, each year the GoU prescribes the areas to be sown to cotton and sets the total production target for cotton during a set of fixed procedures. First, the targeted output and area for cotton are set based on world cotton prices and markets and state budget requirements for the entire country. Next, these targets are allocated to the individual provinces and their districts, which in turn delegate these targets to farmers. In contrast to the common view that Uzbekistan's cotton SP policy is quantity based, in fact the policy is predominantly area and quantity based (Guadagni et al. 2005). The state fixes the size and location of fields on which farmers cultivate cotton and the yield target for farmers, which are set according to the land-suitability and soil-fertility indicator *bonitet* (Chertovitsky, Akbarov, and Yahshilikov 2007).³ Based on these specifications, farmers cultivate about 60 percent of their farmland with cotton each year. To share responsibility for the risk that farmers will fail to meet these procurement targets, the state regulates farm management decisions by determining plowing dates and dates and rates of seeding, irrigation, fertilizer application, and harvesting. The state

therefore plays a major role even in field activities (Veldwisch and Spoor 2008).

Following independence, a cotton pricing system was introduced to nominally increase incentives to farmers. At present, the SP price for cotton is established annually on the basis of the net world market price minus ginning, transportation, custom, and certification costs and taxes paid by intermediate participants (Rudenko 2008). Since independence, the GoU has gradually narrowed the difference between world and domestic cotton prices despite temporary drops in world market prices (Djanibekov 2008). But in 2001 the hypothetical border price of raw cotton was still 52 percent greater than the procurement price paid to farmers (Müller 2006). In 2003, the cotton price of US\$200 per ton paid to farmers in Uzbekistan was still substantially lower than prices in Kazakhstan (US\$550 per ton) and Kyrgyzstan (US\$450 per ton), which abolished its SP system in 1990s (Pomfret 2008). Because the SP price paid to Uzbek farmers is obviously lower than the world market price for cotton, it represents an implicit tax and is an important source of government revenue (Rosenberg, Ruocco, and Wiegard 1999). To provide incentives to farmers to fulfill the SP target, the GoU introduced a "double pricing system" through which half of the SP quota of cotton could be sold either domestically or abroad at a negotiated price that is 20 percent higher than the SP price. This option becomes valid if producers fulfill the procurement quota. Farmers often fail, however, to reach the high production targets (Veldwisch and Spoor 2008). Because the GoU still has a monopoly on cotton marketing, these changes have not yet shown visible results on the ground.

Land Tenure

The GoU holds exclusive ownership of land in Uzbekistan. Farmers are granted nontransferable, usufruct rights based on land lease contracts up to 50 years, and they are prohibited from selling, mortgaging, or exchanging the leased land (Lerman 2008). Furthermore, the state can cancel the land lease contracts with farmers any time, as regularly happens when farmers change their cotton cultivation area. On the other hand, farmers can cancel the lease contract any time if they do not see further benefits from its use.

³ The *bonitet* is a soil fertility indicator based on a comparative assessment of land quality and productivity with a representative level of agricultural activity using a 100-point scale. Areas graded below 40 are considered to be marginal and of poor quality.

Producer Subsidies

Special state subsidies are provided to farmers, particularly those involved in cotton production, for fertilizers, maintenance and operation of irrigation systems, fuel, and machinery services (Bobojonov 2008). Additional subsidies are provided in the form of price differentials for cotton by-products, credit postponements, and tax remissions (Rudenko 2008). For example, in 2004, the total subsidies to agriculture amounted to US\$441 million (Guadagni et al. 2005). Most of these subsidies were allocated not directly to cotton producers, but rather to the agricultural sector as a whole. For instance, subsidies for irrigation, which comprise the operation and maintenance costs as well as the state budget payments to irrigation pumping stations, amounted to 37 percent of all subsidies. The share of implicit subsidies to cotton producers was 33 percent of the total subsidies in 2004. Only 8 percent of these subsidies to cotton producers were provided by the GoU as input price differentials. More than half of the implicit

subsidies were provided in form of targeted loans at a preferential interest rate of 3 percent, which is significantly lower than the market interest rate (Guadagni et al. 2005). The targeted loans are offered to cotton producers through specialized state-managed banks, but they are in fact a direct state financing of producers where costs of and payments for producing cotton are virtual. For instance, the account of the farmer is directly credited and funds are transferred directly from the farmer's account to that of the state-owned input suppliers, even without instructions from the account holder (Veldwisch and Spoor 2008). The credit is automatically deducted by the banks after the account of the farmer has been credited with the payments for the cotton sales. Farmers' restricted access to their own bank accounts and thus to cash, along with fluctuating input prices, affect not only their profitability, but also their flexibility and openness to innovations and improved agricultural technologies.

Box 1: The Partial Market for Cotton in Uzbekistan

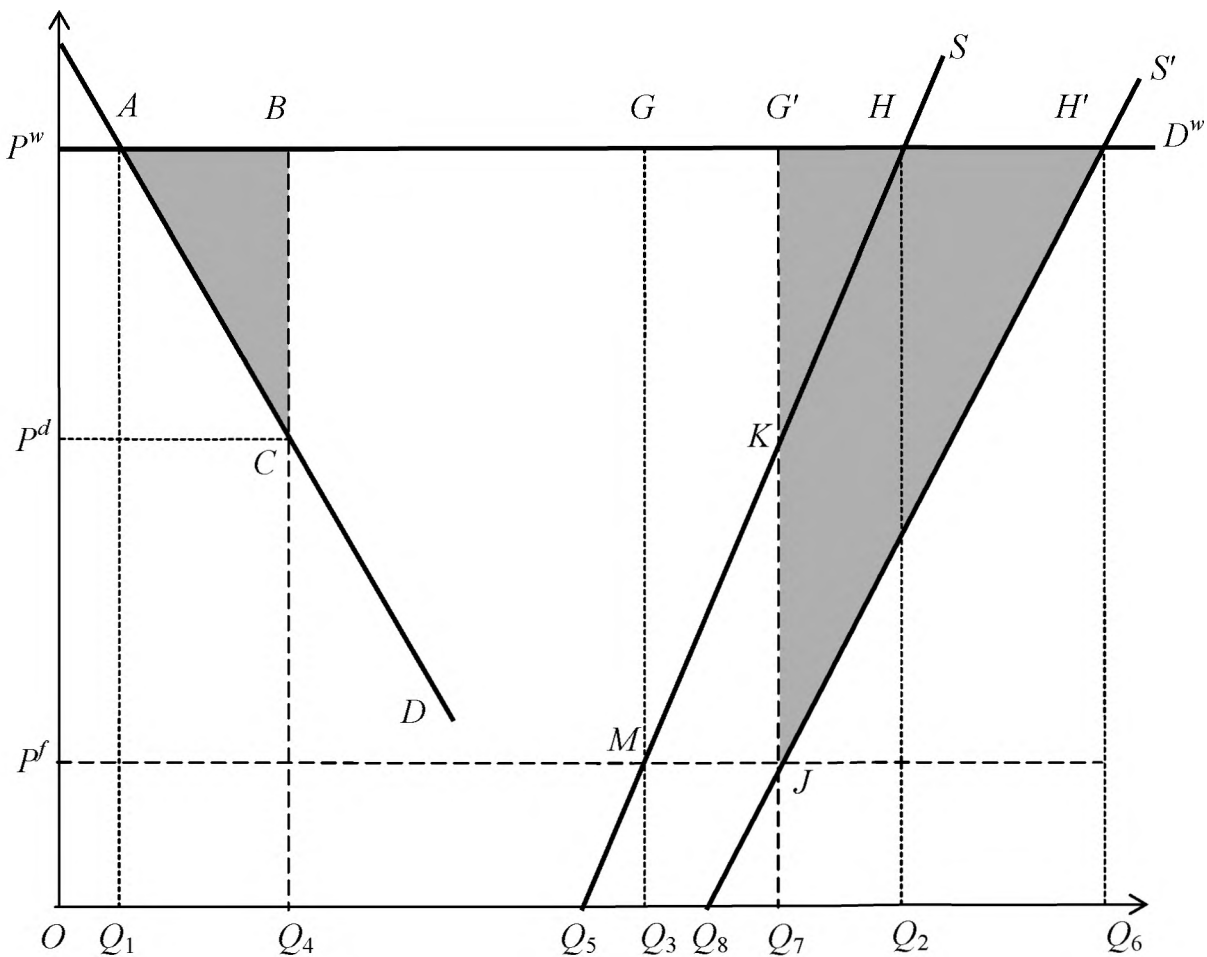
The market for cotton in Uzbekistan can be expressed in a simplified partial equilibrium model (Pomfret 2008). For the sake of simplicity, it was assumed that all relationships are linear. Based on the empirical evidence that Uzbekistan is a small, price-taking country on the world cotton market, it was assumed that the world demand D^w for Uzbek cotton exports is perfectly elastic at the world price P^w . Given the domestic supply S and the domestic textile sector demand D , the free-market outcome would be a situation of cotton production OQ_2 , domestic sales OQ_1 , and exports Q_1Q_2 at P^w .

When considering the existence of a pure double-pricing system in the domestic market, the state sets a controlled price $P^c < P^w$ on a specified output OQ_3 , which allows farmers to sell their additional output at P^w . The domestic sales and cotton production will then be at the levels as in the free-market situation (Q_1 and Q_2 respectively). The only difference between a free market and the double-pricing system is that the latter involves a tax rate equal to $(P^w - P^c)$, which is transferred from the cotton-producing farmers to the state budget at an amount equal to $P^wGQ_3P^c$.

When considering a cotton market in Uzbekistan that diverges from the present pure double-pricing model, three distortions occur: preferential cotton prices for the domestic textile sector, subsidized inputs for cotton-producing farmers, and the state monopoly of the cotton-marketing system. The GoU purchases all produced cotton from farmers at price P^c . To support the domestic textile sector, the GoU sells part of cotton at $P^t < P^w$ and thus stimulates the domestic demand from Q_1 to Q_4 . The rest of the cotton quantity (represented by Q_3Q_4) the GoU exports at P^w . As a result of the preferential cotton prices for the domestic textile sector, the state revenues generated by the cotton tax $(P^w - P^c)$ are reduced by the area P^wBCP^t . Part of this loss (represented by the area P^wACP^t) is transferred to the benefit of the textile sector. The rest (area ABC), is the uncompensated loss for the country.

Due to the cotton tax, the farmers will cut back their cotton production from Q_2 to Q_3 . To stimulate cotton production, the GoU provides subsidies to the cotton-producing farms (for example, through input price differentials) and shifts S to the right (supply curve S'). Because all the output, however, irrespective of the fulfilment of the procurement target or not, is purchased by the GoU at P^f , the farmers cut back cotton production from its new potential double-pricing level, from Q_6 to Q_7 . Nevertheless, because of the subsidies, the farms' surplus increases by Q_5M/Q_8 . The state revenues increase by Q_5GGQ_7 , part of which $[MKJ]$ is in fact a part of farm surplus gained because of the subsidization and transferred back to the state budget. When compared with a pure double-pricing system, the current SP system in Uzbekistan reduces the export earnings of the GoU and the revenues of farmers and creates a deadweight loss to the nation of JGH and ABC .

The Partial Market for Cotton in Uzbekistan



Source: Adapted from Pomfret 2008.

Pros and Cons of Cotton Production

Expansion of Infrastructure

The promotion of cotton necessitated a network of other industrial branches including machine-building plants, chemical facilities, hydroelectricity, and cotton-processing and textile sectors. During the FSU era, Uzbekistan used the centrally transferred budgets to establish an agricultural, industrial, and mining infrastructure as well as a social security net—for example, each citizen had access to health care and education (Pomfret and Anderson 1997). Cotton production also drew on agricultural science. For instance, in 1922, the Institute of Cotton Breeding and Seed Production was established and developed into a major cotton research and breeding center, culminating in the release of numerous cotton cultivars (Ibragimov et al. 2008). Moreover, social network and service provision in rural areas, such as hospitals, schools and kindergartens, libraries, concert halls, cinemas, post offices, and food stores, were set up during the FSU period in every village to ensure efficient and uninterrupted cotton production in the rural areas.

Cotton and Economic Stability

Following the break-up of the FSU, cotton production as an internationally competitive sector of the national economy demonstrated the potential to generate important export revenues (Zettelmeyer 1999). The industrial sector had depended on linkages within the Soviet economy, which were severely affected by the breakup of the FSU, and cotton production was selected as the engine to cushion the domestic shocks (Spoor 1999). Whereas most countries of the FSU suffered dramatic output declines following the breakup of the FSU, Uzbekistan did relatively well in terms of aggregate output because it managed to mitigate the collapse of the industrial sector and diversified the economy by combining state management with subsidies generated from cotton export revenues (Rosenberg, Ruocco, and Wiegard 1999). These revenues also relaxed the external financing constraint for the acquisition of inputs and capital goods that would otherwise have stopped flowing following the disintegration of the FSU (CDPR 2008). Since the beginning of the transition era, export revenues from cotton have contributed to the strengthening of the current account, set the stage for self-sufficiency in energy and foodgrains,

and served as a domestic buffer against the global problems of rising food and energy prices (CDPR 2008). As a result, Uzbekistan has avoided hyperinflation, never recording a four-digit annual increase in the consumer price index (Pomfret and Anderson 1997). Since 1996, consumer price inflation has steadily fallen and positive real growth has resumed (Rosenberg, Ruocco, and Wiegard 1999). At present the country's export revenues are generated by gold and fossil fuels as well as cotton, making Uzbekistan's economy much less vulnerable to fluctuations in world cotton prices compared with the first years after independence (CDPR 2008).

Implicit Farm Benefits

Even if the SP prices are below world market prices for cotton, Rudenko (2008) postulated that some farmers preferred this risk-averse strategy because they were guaranteed a certain price for their cotton and hence were less vulnerable to price fluctuations. Cotton farmers benefit implicitly from a steady supply of agricultural inputs, such as fertilizers and diesel, that the GoU guarantees especially for cotton production. Cotton-producing farms often illegally divert part of these inputs to the production of other crops (Guadagni et al. 2005). In addition, farmers that reliably deliver cotton can build sociopolitical capital that can in turn be used as leverage to acquire additional cropland and inputs or timely and sufficient irrigation water for their entire fields, including for crops other than cotton (Veldwisch and Spoor 2008).

The extraction of cottonseed oil produces various by-products, such as cottonseed cake and husks, which the supplier-farmer can purchase at subsidized prices. These subsidized prices constitute an important benefit because most feedstuff used in livestock rearing, such as wheat bran or maize straw, contains little crude protein but is rich in metabolizable energy (Djumaeva et al. 2009). Mixing the feed diet with cottonseed cake that is rich in crude protein can improve the quality of feedstuff and subsequently the quality of meat or dairy products. Also, cotton seed provides inputs for the production of many traditional commodities, such as refined cottonseed oil for cooking and laundry soap. Cotton stems are used as a combustible for cooking

in rural households. Finally, cotton is a melliferous plant, which also contributes to the expansion of apiculture to areas without a high density of plants and trees.

Taxation of Cotton-Producing Farms

Despite the fact that the input subsidies for cotton producers offset the implicit taxes to some extent (Müller 2006), in 2004 the share of net transfers from the gross income of cotton-producing farmers was 31 percent—equal to US\$249 per hectare of cotton (Guadagni et al. 2005). Since then, the GoU has reduced the amount of subsidies to cotton producers. Furthermore, under the present trend of increasing input prices, the SP prices for raw cotton hardly cover production costs. In the worst case, they may even offset the profits from farming activities on cotton-free lands, which usually provide major cash earnings and thus options for farm investments (Djanibekov 2008).

Existing incentives are not effective at encouraging farmers to exceed state production targets. China, for instance, which has areas with similar climatic conditions as Uzbekistan, had an average cotton yield of 3.3 tons per ha in 2000–04, compared with 2.2 tons per ha in Uzbekistan (Guadagni et al. 2005).

Soil and Water Degradation

The expansion of a quasi monoculture of cotton production during the FSU era took no account of ecological costs. Environmental sustainability was ignored in favor of a precipitous maximization of cotton production, which required the extensive development of the irrigation and drainage networks. The rapid expansion of irrigated cotton without thorough analysis of and investments in proper irrigation and drainage networks led to manifold ecological problems, which the newly independent states have inherited. The demise of the Aral Sea, the fourth-largest lake in the world in 1960, is probably the best-known example of the Soviet pursuit of ever more cotton production. During decades of unsustainable practices in the FSU era, continuous irrigation increased soil salinity to levels that endanger production, requiring a shift to more salt-tolerant crops. Yet cotton tolerance for salinity is one of the reasons why this crop is preferred over alternative crops such as horticultural crops, which are more sensitive to soil salinity. Other crops with a higher salinity tolerance than

cotton are often inappropriate because they cannot earn the same level of foreign exchange revenues necessary for supporting other sectors of the economy.

Stakeholders

The Government

The dominant stakeholder in the entire cotton chain is the GoU, represented by numerous state-managed agencies mandated with separate tasks such as planning the cotton area and harvests, distributing production targets among cotton producers, monitoring agricultural activities, organizing input supply and subsidies, fulfilling quotas, and marketing cotton. The overarching objective of the GoU to maximize export revenues from cotton, which are then invested in other sectors, is an implicit taxation of cotton production. But this practice causes an overall outflow of value from agriculture. The SP price has been steadily increasing, however, and as a result net transfers from the cotton sector dropped from 8 percent of GDP in 2000 to 1.8 percent of GDP in 2004, which amounted to US\$203 million (Guadagni et al. 2005). Some studies showed that subsidies were worth US\$441 million in 2004 and taxation of cotton amounted to US\$644 million—only a moderate difference (Guadagni et al. 2005). Furthermore, when the entire cotton value chain (plus processing) is included in such calculations, then the difference between taxation and subsidization is virtually zero (Rudenko 2008). Still, the transfers from the cotton sector to the state budget have played a crucial role in the ability of the GoU to cushion recessions, in contrast to neighboring Kyrgyzstan and Tajikistan, which abandoned state intervention in the cotton sector as much as possible following independence but then faced substantial problems in achieving economic stability (Rosenberg, Ruocco, and Wiegard 1999).

Farmers

Another group of stakeholders affected by the cotton SP consists of farmers, and not necessarily only those producing cotton. From a producer perspective, the system of cotton monoculture on a large part of the country's cropland reduces crop diversification, which in turn reduces the scope for income diversification and increases the risk to farmers' incomes. On the other hand, the SP

strategy secures supplies of inputs such as water and fertilizers first and above all for cotton producers. This strategy, however, adversely affects the production options and in turn the revenues of noncotton farmers.

Nonagricultural Actors in the Cotton Chain

Farmers are not the only actors in the cotton value chain (Figure 2). After farmers produce the raw cotton, it is processed, cleaned, and ginned before being exported or used by the textile industry. Other stakeholders in the cotton production chain are thus ginneries, the textile industry, including spinning and weaving factories, and exporting agencies. Because of the complex nature of the cotton value chain and the many actors seeking revenue, recent in-depth analyses showed that cotton-producing farmers in Uzbekistan received only about 66 percent of the world market price in 2004/05 for their raw cotton, and the remaining 34 percent was distributed among the service-providing actors of the cotton chain, such as the trade companies, certification centers, customs, financial institutions, and the transportation network (Rudenko, Lamers, and Grote 2009).

The Rural Population

The majority of the population in Uzbekistan is rural, and agriculture plays a key role in their income generation. Yet large amounts of cotton export revenues are invested in the development of other sectors. This practice diverts rural incomes to urban inhabitants and provides only limited scope for increasing the incomes of farms involved in cotton production. The low consideration for agricultural and farm work, combined with low remuneration, also drives labor migration to urban areas. This migration in turn leads to a lack of highly qualified personnel, such as accountants and agro-engineers, in rural areas.

From a social perspective, cotton taxation has provided resources for social assistance and limited the declines in health and education expenditures that other FSU countries have experienced (Pomfret 2000). The cotton sector provides jobs to a vast number of people employed in the entire cotton value chain. This value chain absorbs unskilled labor in rural areas, such as young people and those who are not qualified for work in the Uzbekistan's industrial or service sectors. It can thus be argued that the cotton value chain creates a

substantial level of social security despite the wage levels. A decline in cotton production, which may follow the liberalization of the cotton market according to Djanibekov (2008) and Bobojonov (2008), may require a rapid transfer of abundant labor to other sectors of the economy.

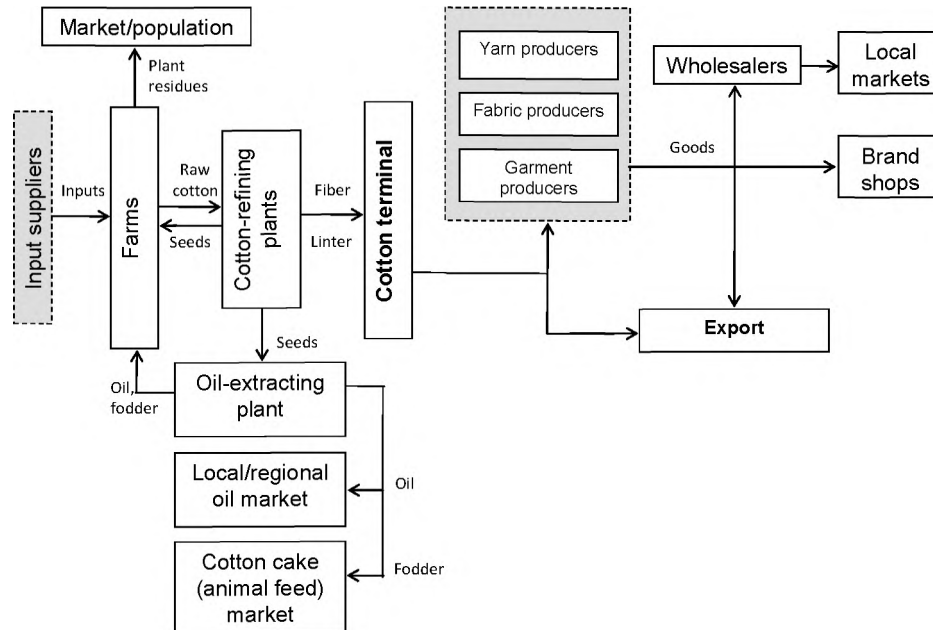
Policy Options

Agriculture in Uzbekistan offers many opportunities that can be mobilized with further incentives. Although SP is an important instrument to ensure the availability of foreign exchange, the continuous success of cotton production is influenced not only by the SP system, but also by market-related factors such as input and output prices. It is likely that the GoU will maintain the SP system as long as it provides sufficient benefits to the national budget or until enough other sources of state revenue become available to make the SP policy less relevant to the entire economy of Uzbekistan. It can be argued that more market-oriented policies could also produce the level of revenues generated by the SP system. There are options for modifying and upgrading the SP policy in ways that could stimulate the growth of the agricultural sector.

Policy Measure 1: Adopt Advanced Cotton Varieties and Agricultural Technologies

Farmers in Uzbekistan produce on average 2.6 tons per ha of raw cotton, or about 0.85 tons per ha of cotton fiber—Uzbekistan thus falls in a range of average-yielding countries (Rudenko 2008). Several possibilities exist for raising cotton yields in Uzbekistan. Examples include drip irrigation, increased fertilizer-use efficiency through the use of subsurface fertilizer application, the use of improved or more salt-tolerant varieties, the introduction of conservation agriculture, and the promotion of appropriate crop rotations. In addition, there are opportunities for introducing organic cotton production, although they are currently limited by the low availability of organic fertilizers such as manure (Franz, Bobojonov, and Egamberdiev 2010). Genetically modified (GM) cotton is currently not cultivated in Uzbekistan. The GoU is concerned about the unknown long-term effects on human and animal health (Rudenko 2008), so feasibility studies on the potential for GM cotton to improve yields and quality in Uzbekistan have not yet been conducted.

Figure 2: The Cotton Chain in Uzbekistan



Source: Adapted from Rudenko 2008.

Policy Measure 2: Improve the Structure of the Cotton Value Chain

The enabling environment of the cotton chain is shaped by various actors, such as the Ministries of Agriculture and Water Resources, Finance, Economy, Foreign Economic Relations, Trade, and Development, as well as organizations and institutions such as UzStandart Agency and the Cottonseed Corporation. A shortening of the cotton chain, or a reduction in the number of monitoring and controlling actors in the cotton value chain, would free up the share of export revenues currently absorbed by these actors. If this revenue were then allocated to farmers, it could help them build up farm capital for investments [Rudenko, Lamers, and Grote 2009]. It will take time to change the structure of the cotton chain and the mindset of stakeholders. In addition, stakeholders further along the cotton chain such as ginneries and textile factories would need to

develop additional skills, such as marketing, to become effective if the existing structure is eliminated. Moreover, privatizing and upgrading various main actors in the chain such as the ginneries could lead to the elimination of various intermediate agents and thus to lower transaction costs and higher returns to farmers.

Policy Measure 3: Further Develop the Ginning and Processing Industries

Currently almost all ginneries use outdated equipment for processing raw cotton into marketable cotton fiber. Public and private investments in the local ginnery and textile sectors could strengthen the economic benefits from cotton production in Uzbekistan. State-run ginning in Uzbekistan is now less expensive than in many cotton-producing

countries. For example, in Uzbekistan average ginning costs amount to US\$158 per ton of fiber, compared with US\$549 per ton of fiber in Spain (Rudenko 2008). At the same time, the present level of losses at the ginneries in Uzbekistan is higher than in other countries, and efficiency is lower. Uzbekistan has a ratio of fiber to raw cotton of 32 percent (known as the ginning outturn), whereas in many cotton-producing countries the ginning outturn averages 39 percent, and in the countries of West and Central Africa the figure is 40–43 percent. Modernizing the country's ginneries could improve ginning efficiency and increase the output of cotton fiber; it has been estimated that the cost of this modernization would pay for itself in about two years. Guadagni et al. (2005) estimated that it would increase output by 16 percent. A privatized ginning sector made up of many competing private ginneries would offer farmers the option of selling cotton at prices directly linked to the world market price and thereby increase farmers' incentives to boost cotton yields and quality.

Each year Uzbekistan produces more than 1 million tons of cotton fiber, part of which could be used at low transport costs by the domestic textile sector. Currently only 18 percent of cotton fiber is used for domestic value-added processing and manufacturing, so there is significant potential for further development of cotton processing. Uzbekistan has a qualified, low-cost labor force for the production and export of ready-made textile products. As Uzbekistan shifts from being an exporter of cotton fiber to a producer of multiple textile products, its economy will be less affected by the vagaries of a single commodity market. This approach will, however, require adjustments in customs regulations, taxation, and transportation as well as public and private investments in the industrial upgrading of local producers and subsequent upgrading of products. Uzbek cotton products could achieve greater competitiveness and world recognition if the industry could produce higher-quality products with greater "fashion content," develop highly demanded brands, deliver products quickly and reliably, and improve the sustainability and safety of industrial systems for the environment and the employees.

An increase in local textile production would allow Uzbekistan to earn the same revenues while reducing land and water use for cotton production by

more than two-thirds (Rudenko 2008). This change would allow for intensification of cotton production in favorable locations and permit less fertile and marginal soils to be retired or used for another purpose. Reduced use of water for cotton would lower the risk of water shortages due to climate change.

Policy Measure 4: Modify the Cotton Procurement Mechanism

This policy measure aims at adjusting the current state targets for cotton, which are based on predetermined outputs from predetermined areas. One approach is to relax the influence of the national administration over land use and ease state directives on input applications. This approach would retain the SP system but shift from an area-based to a quantity-based system in which farmers would still need to produce the required amount of cotton. A farther-reaching alternative would be to fix a lump amount of cotton to be produced over several years instead of setting the production targets annually—for example, farmers would need to produce a fixed amount of cotton for the state over three years. Both modifications of the SP policy would offer farmers the option of cultivating different crops with higher profits if they managed to fulfill the production target for cotton using less land. The main prerequisite for both modifications is that farmers be free to decide on crop management techniques; if they are not, the modified procurement mechanism would not cause the anticipated increase in productivity and farmers would fail to deliver the assigned targets. In addition, this approach would allow farmers to introduce crop rotations for improving soil fertility. Little interference in farmers' production decisions was the key element in China's agricultural growth in the early 1980s, although farmers still had to sell a part of their output at state-determined prices (Pomfret 2000). This approach is not without risks, however, including an ever-increasing application of fertilizer to reduce cultivated area and increase cotton production.

Another option consists of extreme reform, such as a complete liberalization of the cotton sector where cotton marketing and exports are liberalized and cotton production depends entirely on producer decisions. If the state-determined area and output targets for cotton cultivation were removed, farmers could independently decide

which crops to grow and where to sell (Box 1). If farmers were released from procurement targets, however, cotton area could decline as farmers expand the cultivation of other crops such as rice, vegetables, and melons, which are more profitable and currently restrained by cotton production (Bobojonov 2008). Furthermore, there is evidence that gross farm income would increase at the expense of higher demand for water because more farmers could choose the most profitable and water-intensive cropping activity—rice cultivation—which may cause serious problems in Uzbekistan (Djanibekov 2008). Under this scenario, the state would need to pay more attention to improving farm support services such as credit institutions and fertilizer, pesticide, and equipment suppliers, as well as creating incentives, such as water pricing, so that removal of the SP system would not threaten sustainable farm development by leading to the overuse of particular inputs like water.

A shift from implicit taxation of cotton producers to direct taxation—for example, through water charges and increased land tax—together with reforms of the procurement and input supply systems, can guarantee an overall increase in the direct tax flows to the state budget (Guadagni et al. 2005). Possible losses of export revenue from a liberalized cotton market can be prevented if the government imposes export taxes in dollars on Uzbek companies involved in exporting agricultural commodities.

Assignment

Your assignment is to recommend to the relevant stakeholders an appropriate policy or set of policies to ensure economic growth in the cotton sector, taking into account the trade-offs between the state and farmers as well as potential short- and long-term effects of recommendations on the national economy, social security, and the environment.

Additional Readings

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