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Cotton:
Review of the World Situation

ICAC International Cotton Advisory Committee

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Supply and Distribution of Cotton
April 1, 2018

Seasons begin on August 1

	2013/14	2014/15	2015/16	2016/17 Est.	2017/18 Proj.	2018/19 Proj.
	Million Metric Tons					
BEGINNING STOCKS						
WORLD TOTAL	**19.428**	**21.317**	**22.973**	**20.312**	**18.83**	**19.10**
CHINA	10.811	13.280	14.118	12.650	10.63	9.24
USA	0.827	0.512	0.795	0.827	0.60	1.25
PRODUCTION						
WORLD TOTAL	**26.225**	**26.269**	**21.485**	**23.095**	**25.67**	**25.35**
INDIA	6.766	6.562	5.746	5.865	6.20	6.07
CHINA	7.000	6.600	5.200	4.900	5.34	5.34
USA	2.811	3.553	2.806	3.738	4.58	4.23
PAKISTAN	2.076	2.305	1.537	1.663	1.80	2.09
BRAZIL	1.734	1.563	1.289	1.530	1.70	1.62
UZBEKISTAN	0.910	0.885	0.832	0.789	0.80	0.80
OTHERS	4.928	4.801	4.075	4.610	5.25	5.19
CONSUMPTION						
WORLD TOTAL	**24.101**	**24.587**	**24.139**	**24.516**	**25.40**	**26.52**
CHINA	7.600	7.550	7.600	8.000	8.12	8.36
INDIA	5.087	5.377	5.296	5.148	5.30	5.57
PAKISTAN	2.470	2.467	2.147	2.147	2.35	2.46
EUROPE & TURKEY	1.611	1.692	1.687	1.612	1.63	1.85
BANGLADESH	1.129	1.197	1.316	1.409	1.44	1.59
VIETNAM	0.673	0.875	1.007	1.168	1.31	1.40
USA	0.773	0.778	0.751	0.708	0.73	0.74
BRAZIL	0.862	0.797	0.660	0.690	0.72	0.73
OTHERS	3.896	3.854	3.675	3.635	3.79	3.82
EXPORTS						
WORLD TOTAL	**9.029**	**7.779**	**7.548**	**8.191**	**8.54**	**9.14**
USA	2.293	2.449	1.993	3.248	3.20	3.49
INDIA	2.015	0.914	1.258	0.991	0.97	0.85
CFA ZONE	0.973	0.966	0.963	0.972	0.98	1.16
BRAZIL	0.485	0.851	0.939	0.607	0.88	0.90
UZBEKISTAN	0.615	0.550	0.500	0.403	0.34	0.44
AUSTRALIA	1.058	0.527	0.616	0.812	0.93	0.88
IMPORTS						
WORLD TOTAL	**8.858**	**7.800**	**7.575**	**8.142**	**8.54**	**9.14**
BANGLADESH	1.112	1.183	1.378	1.412	1.60	1.55
VIETNAM	0.687	0.934	1.001	1.198	1.46	1.43
CHINA	3.075	1.804	0.959	1.096	1.39	1.85
TURKEY	0.924	0.800	0.918	0.801	0.82	0.83
INDONESIA	0.651	0.728	0.640	0.746	0.79	0.78
TRADE IMBALANCE 1/	**-0.171**	**0.020**	**0.027**	**-0.049**	**0.00**	**0.00**
STOCKS ADJUSTMENT 2/	**-0.063**	**-0.047**	**-0.034**	**-0.013**	**0.00**	**0.00**
ENDING STOCKS						
WORLD TOTAL	**21.317**	**22.973**	**20.312**	**18.828**	**19.10**	**17.93**
CHINA	13.280	14.118	12.650	10.632	9.24	8.06
USA	0.512	0.795	0.827	0.599	1.25	1.25
ENDING STOCKS/MILL USE (%)						
WORLD-LESS-CHINA 3/	**49**	**52**	**46**	**50**	**57**	**54**
CHINA 4/	**175**	**187**	**166**	**133**	**114**	**96**
COTLOOK A INDEX 5/	**91**	**71**	**70**	**83**	**84**	

1/ The inclusion of linters and waste, changes in weight during transit, differences in reporting periods and measurement error account for differences between world imports and exports.
2/ Difference between calculated stocks and actual; amounts for forward seasons are anticipated.
3/ World-less-China's ending stocks divided by World-less-China's mill use, multiplied by 100.
4/ China's ending stocks divided by China's mill use, multiplied by 100.
5/ US cents per pound.

Summary of the Outlook for Cotton

Lower Production and Higher Consumption in Global Outlook

It is projected that global production for 2017/18 (25.7 million tons) will eclipse consumption (25.4 million tons). Ending stocks are projected to grow by 1.5% to 19.1 million tons. Chinese stocks have continued to move down and are projected to finish the season at 9.2 million tons. Stocks in the rest of the world have moved in the opposite direction and are projected to increase 20% to 9.9 million tons. The global stocks-to-use ratio, which provides a measure of the tightness of cotton in reserves relative to use, is projected to adjust slightly down from 0.77 for the 2016/17 season to 0.75 for the 2017/18 season. This remains above the average ratio from 1990/91 to 2010/11 of 0.49. The global stocks-to-use ratio is projected to maintain relative equilibrium from the previous season due to Chinese reserves trending down, while stock levels elsewhere are rising.

The Chinese reserve auction has been under way for the last few weeks with slow sales. Current projections for imports by China are 1.39 million tons for 2017/18. Due to slow sales and low quality, mills in China will likely look elsewhere to fulfil their manufacturing needs.

Strong expectations for global cotton consumptions are projected for the short-term based on increased demand by mills. High prices for cotton that influence planting decisions may exert downward pressure on mill use. But the expanding middle class in emerging markets with sizable populations is expected to continue to be a major driver of demand. Strong global textile demand will benefit cotton, especially in the emerging economies of China and India with large populations and a growing number of low to middle income consumers. Environmental costs and concerns around the production of synthetics is expected to encourage cotton use in textiles. Consumption has steadily increased over the last three seasons with projected growth of 3.6% in 2017/18 and 4.4% in 2018/19.

In the short-term, cotton mill-use and demand for cotton textiles will likely be driven by global economic expansion and population growth. Long-term growth for cotton consumption may have the additional potential to be supported by innovation in cotton textiles and consumer awareness around sustainable textiles.

The current outlook for 2018/19 is based on strong projections for demand by mills for textile manufacturing despite high prices for producers. Projected low-price volatility in cotton may provide stability for manufacturing inputs and benefit textile production.

The largest global producer, India, is expected to lower planted area in 2018/19 to 11.9 million hectares following the pink bollworm infestation that caused yield losses in major cotton producing regions in central and south India. US planting intentions are expected to increase for 2018/19 to 4.9 million hectares based on relatively high prices and favourable government policies. Recent legislation has returned commodity support for cotton as a combined cottonseed and lint program, however drought conditions in cotton planting regions are a major concern and will be monitored. Water availability may also be a concern for Australia where planted area is also expected to decline for the coming season to 450,000 hectares.

The current outlook for 2018/19 is susceptible to environmental, economic or political uncertainties that may arise during the course of the season. Some caveats are known. Global production decreases in 2018/19 may likely be due to decreased planting area in the largest global producer, India. Weather conditions for the largest global exporter, the USA, may factor in further reducing the availability of quality cotton for consumption which may in turn push prices higher.

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Recent Changes in U.S. Cotton Policies

By Andrei Guitchounts, ICAC

On February 9, 2018 the U.S. Congress passed budget legislation that included the designation of seed cotton (unginned upland cotton that includes both lint and cottonseed) as a covered commodity under Title 1 Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC) programs in the 2014 Farm Bill beginning with the 2018 crop. Beginning with the 2019 crop, a farm enrolled in coverage for seed cotton is not eligible for STAX. This event marks a significant backward change in cotton farm policies from insurance programs to guaranteed payments based on reference price similar to counter cyclical payments in effect under the 2008 Farm Bill. This change will mean a significant increase in support to upland cotton production. The new program is based on seed, not lint cotton, yet will result in increased income support to cotton producers in a manner similar to pre-2014 Farm Bill and is likely to result in increased U.S. cotton plantings. This new program is expected to be remain in the 2018 Farm Bill currently being drafted.

Under the new legislation there is no longer a generic base on a farm. Generic base is former cotton base on a farm under the 2008 Farm Bill. Landowners will have options on how to convert generic base to seed cotton base, or to base of seed cotton and other covered commodities (peanuts, corn, soybean, wheat, etc.) based on planting history of 2009-2012.

The price-based program, Price Loss Coverage (PLC), is similar to the former Counter Cyclical Payments program. PLC makes a payment to producers (now at a rate of 85% of base acres) when the market price for a commodity falls below the fixed reference price. PLC cannot be combined with ARC-CO for the selected commodity. Although reference prices are fixed by legislation, farmers may be able to increase payments for years when production falls by updating farm yields. For commodities covered under PLC, the Supplemental Coverage Option is available to provide additional protection against yield loss.

The payment rate under the PLC rate has yet to be established. The PLC reference price is set at 36.7 cents per pound and the price floor is at 25 cents per pound. Seed cotton Marketing Year Average (MYA) price is a weighted average of the upland cotton lint price and the cottonseed price. Lint and cottonseed prices are weighted based on annual shares of production. The MYA price is not final until the end of the marketing year (Aug. 1 – July 31), but the USDA publishes monthly estimates. The seed cotton MYA price is calculated as: (U.S. Upland Cotton Lint Production x U.S. Upland Cotton Lint MYA Price + U.S. Cottonseed Production x U.S. Cottonseed MYA Price) / (U.S. Upland Cotton Lint Production + U.S. Cottonseed Production). The National Cotton Council (NCC) calculated an example of the seed cotton MYA price based on this formula and on USDA February 2018 estimates, where U.S. Upland Cotton Lint MYA price was 69 cents per pound, U.S. Cottonseed MYA price was US$150 per ton, U.S. Upland Lint Production was 20.57 million (480 pound) bales and U.S. Cottonseed production was 6.73 million tons. The calculation resulted in the Seed Cotton MYA price of 33.53 cents per pound, or 3.17 cents per pound below the reference price.

To calculate payment, payment yield has to be established. If a farm has generic base (former cotton base) that base also has a cotton Counter Cyclical Payment (CCP) yield already established for it under the 2008 Farm Bill. This was the yield used to make Counter Cyclical Payments under the former legislation. For purposes of the seed cotton program, landowners will be given an option of keeping this current CCP yield or updating it to 90% of the average yield for 2008-2012. The same opportunity was given for covered commodities to update PLC payment yields for the 2014 Farm Bill. The seed cotton payment yield will be lint yield multiplied by 2.4. Upland cotton lint payment yield will be the higher of the CCP lint yield or the updated yield. Payment is made when the reference price exceeds the higher of the MYA price and the price floor. Eighty five percent of seed cotton base acres are eligible for payment. Seed cotton PLC payment would be (Reference Price – higher of MYA price or 25 cents) x Seed Cotton PLC Payment Yield x Seed Cotton Base x 85%. In the NCC example calculation, if we assume that cotton lint yield is 800 pounds per acre, the PLC payment would be US$51.73 per base acre. The maximum possible PLC payment is US$190.94 per base acre.

In the county revenue program, Agricultural Risk Coverage (ARC-CO), farms select revenue protection on a commodity-by-commodity basis. ARC-CO replaces the previous Farm Bill's state-based revenue program, Average Crop Revenue Enhancement (ACRE). Commodity revenues are benchmarked against county revenues for each commodity, calculated using a moving 5-year Olympic average of county yields and national prices. Revenue payments are based on 85% of the covered commodity's base acres when county revenue is 86 to 76% below the benchmark county revenue, capped to be no more than 10% of the benchmarked revenue. High average county yields could eliminate payments and payments will likely vary among neighboring counties.

The ARC-CO program provides revenue loss coverage at the county level. The ARC-CO payments are issued when the actual county seed cotton revenue is less than the ARC-

CO guarantee. The ARC-CO guarantee is 86% x Benchmark Seed Cotton MYA price x Benchmark Seed Cotton yield. The Benchmark Seed Cotton MYA price is an average of the previous 5 years Seed Cotton MYA price, excluding the years with the highest and the lowest price (Olympic Average). If the MYA price in any of the 5 years is below the reference price (36.7 cents per pound), the reference price is substituted for the MYA price. The Benchmark Seed Cotton Yield is an average of the previous 5 years county Seed Cotton Yield, excluding the years with the highest and the lowest yield (Olympic Average). If the country yield in any of the five years is below 70% of the county transitional yield (T yield), then70% of the T yield is substituted for each year the county yield is less than 70% of T yield.

Actual Revenue is U.S. Seed Cotton MYA price x Seed Cotton Yield. Benchmark Revenue is Benchmark Seed Cotton MYA price x Benchmark Seed Cotton Yield. Maximum ARC-CO payment is 10% x Benchmark Revenue. Revenue shortfall is ARC-CO Guarantee minus Actual Revenue. ARC-CO Payment per Base Acre is minimum of (maximum ARC-CO Payment, Revenue Shortfall) x 0.85.

For the 2018 crop, the STAX insurance product may be purchased for acres of upland cotton planted on a farm enrolled in the seed cotton PLC/ARC program. PLC/ARC payments for seed cotton are subject to the payment limit of US$125,000 applicable to covered commodities (other than peanuts). The provisions of the non-recourse marketing assistance loan for upland cotton lint remain unchanged with the marketing loan rate returning to 52 cents per pound for the 2018 crop.

A one-time PLC/ARC election must be made by producers on a farm with seed cotton base. A farm failing to make a unanimous election between the two will be assumed to choose PLC for seed cotton. Decisions between ARC-CO and PLC are based on a farmer's expectation of price movement compared to program yields. While choices for Title I commodity programs are one-time decisions for the life of Farm Bill, farmers can elect the supplemental crop insurance under Title XI on a yearly basis for commodities not covered by the ARC program. Federal crop insurance programs subsidize 65% of the premium paid by farmers for the individual private crop insurance policy they purchase.

Mechanized Farming Over the Past 20 Years from 1915 to 2015 in East and Southern Africa: History, Economics, Social and Constraints

By Marco C. Mtunga, Tanzania Cotton Board (Mwanza), and
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Abstract

This review has shown that smallholder agriculture is the mainstay of crop and food production in the Eastern and Southern African (ESA) countries. With fast population increase, the need to meet the growing demand for more food and industrial raw materials was immediate and pressing. It was however, observed that smallholder farmers in these countries have limited access to mechanization input, amongst others. Mechanization has been frequently neglected in farm productivity improvement efforts. On the other hand, it has been shown that smallholder farmers often had difficulties in making necessary investment in mechanization and that the mechanization services provided to them by government, private and donor projects were not, to a large extent, sustainable. For sustainability there should be a political will from the government and there should be a mechanization input supply chain built upon internal local manufacturers. This should be fast-tracked in the ESA countries as mechanization had been very slow. Research and development should be improved and training based on extensive local field experience on mechanization should be provided.

On the other hand, in Tanzania and its cotton growing areas in particular; mechanized farming has to be boosted in order for the country's ginning over-capacity to be fulfilled. This could involve wider and strong promotion of time-saving, simple farm mechanized-technologies such as ox-plough and other animal drawn implements including, sub-soilers, cultivators, planters, and weeders. These concurrently, had to go hand in hand with the introduction of new tractor drawn implements and equipments. The mechanized farming of cotton in addition to raising cotton crop productivity it will also aid in coping with and mitigating some of the climatic challenges facing these areas.

Keywords: *mechanization, implements, smallholders, productivity.*

Background

Farm mechanization includes the use of machines, whether mobile or immobile, small or large, run by power and used for tillage operations, harvesting and threshing but also includes power lifts for irrigation, trucks for haulage of farm produce, processing machines, oil pressing and cotton ginning.

The main power sources include humans, where hand tools technology is used. This is the simplest and most basic level of all agricultural mechanization. Another one is draught animal power (DAP). This is the utilization of animal muscles as a source of power. Lastly is mechanical power, which is the highest level in agricultural mechanization. It embraces all agricultural machinery which obtains its main power from sources other than human and animal muscles. Sophistication in mechanization brings-in other improvements in agriculture techniques, besides an increase in production, efficiency, productivity and lowering costs of work.

It is clear that Africa has comparatively abundant land resources; however, the region has the lowest farm power base with less than 10 percent of mechanization services provided by engine-powered sources. Farms often only has rudimentary tools and equipment at its disposal for soil preparation, crop care, transport of goods and bucket irrigation (Kienzle *et al.*, 2013).

There is arguably no other economic activity where the Eastern and Southern Africa (ESA) and Sub Saharan Africa countries in general, has been comprehensively overtaken and by-passed by technology development than in agricultural mechanization (Hatibu N, 2013). Just as it has been a matter of human sweat and drudgery for centuries and so it remained today, for the majorities in Africa.

The East and Southern Africa (ESA) cotton growing countries are the United Republic of Tanzania, Kenya, Uganda, Zimbabwe, Malawi, Mozambique, Zambia and South Africa. Kenya, South Africa and Zimbabwe, were the trend setter in agricultural mechanization. However, a general stagnation ensued and at some point in time backpedaling occurred in the mechanization trends gained, all with common problems around mechanization and also a problem for small farms. Specific strategies for small farms for agricultural mechanization were recommended (FAO, 1997). It was observed that in most agricultural research much emphasis was placed on increasing efficiency with land, water and soil nutrients whereas, farm power appears to be a forgotten resource. This is a major concern, when farm power in ESA is declining due to the collapse of most tractor hire schemes, the decline in number of draught animals and the growing shortage of human labor. A consequence of low levels of farm mechanization is higher labor drudgery which makes farming unattractive to the youth and disproportionately affecting women. Over the past three decades not only has progress stalled in agricultural mechanization in much of the ESA, but also there is accumulating evidence that progress attained in agricultural mechanization in the early years is being lost in many parts of the continent (Mrema, *et al.,* 2008).

In Tanzania over 75% of its about 55 million people live and earn their living in rural areas with agriculture as the mainstay of their living. They are smallholder farmers cultivating between 0.2 and 2.0 ha with low levels of mechanization. Hand hoe dominates the farming system whereas animal traction and mechanical power are estimated at 24 and 13%, respectively.

Out of 44 million hectares of arable land only 23% is under cultivation. Agricultural mechanization has the potential of turning idle arable land into productive farms for national economic growth.

However, these smallholder farmers have low purchasing power due to lower producer prices, lack of agricultural credit as well as, the well-trained machinery operators, compounding their general poor technical know-how.

There are however opportunities, as the importation trend of mechanical power machines such as single and two axle tractors and secondary tillage implements shows a steady increase. The private sector is encouraged to acquire machinery and provide hiring services to farmers for primary and secondary agricultural operations. Research and Development is being undertaken at the Universities and other technical institutions on soil and water conservation techniques based on animal drawn implements and labor-saving weeding and planting technologies. For its part, the Tanzanian Government has put in place short and long term specific actions and strategies to raise the general level of mechanization and reduce agricultural drudgery.

Objective

The main objective of this review was to highlight the history of mechanical farming in Tanzania including the major production phases that were mechanized and the statistics and future perspectives of mechanization in the Eastern and Southern Africa with a Tanzanian perspective.

Methodology

Reviews and secondary data were used. A literature review was conducted for the analysis on mechanization information and studies from different sources collected from secondary information.

Results and Discussion

Mechanization farming in ESA countries in the past 20 years from 1995-2015

The period under review was dominated by globalization, return of relative calm in the region, market economy experimentation and accelerated growth of the service market. Trends of agricultural mechanization were different for smallholders and large-scale farming. There was a more limited mechanization in the smallholder than in the large-scale farms both in public and private farms, where irrigation was party. Table 1 shows the mechanization levels in SSA as compared to India and China at the same period.

Table 1: Source of Power of Primary Land Preparation in Some Countries in SSA and Asia (% of cultivated land) in 1992, in Comparison with India and China

	Human power	Draught animal power	Mechanical power
Sub Saharan Africa	80	16	4
Botswana	20	40	40
Kenya	84	12	4
Tanzania	80	14	6
Zimbabwe	15	30	55
South Africa	10 (20)*	20 (60)*	70 (20)*
India	18	21	61
China	22	26	52

Source: COMSEC (1992) * Estimated values under smallholder farming communities

Guaranteed markets have been one of the drivers of agricultural mechanization. For example, cotton production was the main driver of mechanization with draught animal power (DAP) and tractors use in Tanzania and Uganda. There was a clear symbiotic relationship between the expansion of cotton production and the expansion of mechanization of field operations. That is why the DAP is universally used in the cotton growing Sukumaland of Tanzania and in the cotton growing areas of Uganda (Starkey, 2000). Therefore, sub sectors with good access to the markets such as the traditional cash crops such as tea, cotton and sugarcane, especially under estate farming conditions, have been the drivers for mechanization.

In Zimbabwe as of 1999 and prior to the launch of the third phase of the Land and Agrarian Reform Programs of 2000, the level of farm mechanization was dominated by the historical background of communal, old resettled, small scale and large commercial farming sub sectors. The large-scale commercial farms practiced mechanized, high-inputs high-output farming. It was characterized by being in receipt of private and public resources of agricultural finance and credit. In contrast the communal farming sector had limited access to productive resources and infrastructure. These smallholder farming communities practiced rainfed agriculture with low-inputs low-output technologies. To date up to 300,000 smallholder farmers have been resettled on the land acquired by the government from former large scale commercial farmers. Each household was allocated 5 hectares of arable land and 6-20 hectares grazing land depending on the ecological zone. The main source of farm power for agricultural production was provided by animals. There were also hire services at the District Development Fund (DDF) providing a tractor hire service for tillage (ploughing, discing, rolling and planting). It has also been shown that smallholder farmers were mostly investing in animal drawn implements such as ploughs, cultivators, harrows and scotch-carts (Mlambo, 2004, Simalenga 2005).

In Zambia the smallholder mechanization support program has been designed to address the inadequate farm power and mechanization which currently is one of the limitations to increase the agricultural production especially among the smallholder farmers. The majority of small and medium scale farmers are still dependent on hand labor for agricultural operations, a few using DAP. As a result, land utilization and productivity are very low.

About 80% of the equipment used in South Africa is imported and these are mainly high-tech items. Tractor sales constitute the bulk (60%) of the total agricultural equipment market. During 2005 tractor sales were 4,677 units. The number of working animals was as follows, cattle 9,000, donkeys 190,000, horses 70,000 and 1500 mules. The annual sale of animal drawn implements has been estimated at 5,000 units per year (Simalenga et al 2003). There is however, a limited knowledge or appreciation of the important role that DAP plays in the small-scale farming, amongst both to the decision or policy makers and to the extension service. Training, access to information, equipment, spares, harnesses, lack of research and development in DAP, are among the key constraints which appears to contribute to the low level of mechanization under smallholder farming conditions.

Generally, the smallholder agricultural sector in Mozambique is advancing well since the end of hostilities of 1990s. Smallholder farming predominates and over 70 percent of the population lives in rural areas (World Bank 2009). The use of technology is very low. The use of animals and mechanical traction, improved seeds and chemical inputs is some of the avenues to turn low technology agriculture into an intensive–high productivity system in rural areas of Mozambique. Access to capital to acquire assets like draught power and machinery is however,

seriously constrained. Lack of financial resources also constrains smallholders' access to agro-chemical inputs.

In the Eastern African countries, it is refreshing to note that the current policies prioritize mechanization of agricultural operations. In Tanzania the KILIMO KWANZA (Agriculture first) initiative calls for increased supply of agricultural machinery and implements by:

1) Reviving privatized manufacturing plants for farm implements;
2) Embarking on local manufacturing of agricultural machinery and implements
3) Ensuring that industrial strategies address the needs of agricultural mechanization

On the other hand, in Uganda the government has adopted a mechanization policy to promote the utilization of appropriate farm machinery and equipment with the following elements (MAAIF, 2005):

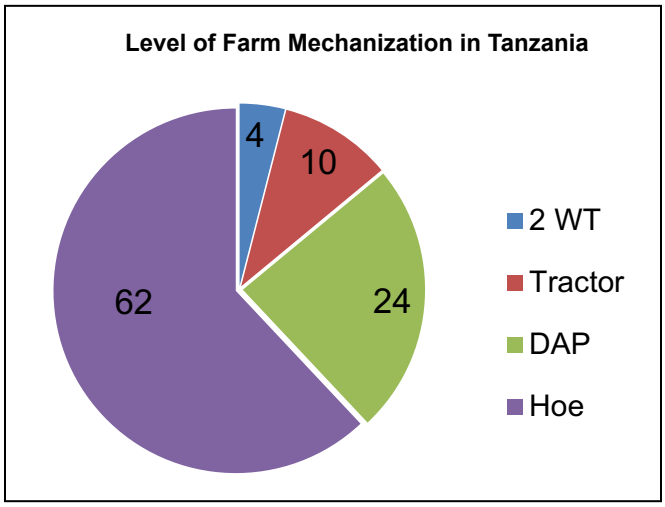
- Provision of conducive environment for the private sector to acquire, maintain and repair agricultural machinery;
- Promotion of agricultural machinery hire services units in different agro-ecological zones and,
- Re-establishment of animal traction development centers in traditional and non-traditional areas.

The machinery and equipment supply system in East Africa has historically been dependent on importation, first from Europe, then from North America and recently from China, India and Vietnam. The importation of agricultural tractors is generally a good indicator of the rate at which mechanization is taking place. Importation to Tanzania was for some time boosted by a local assembly plant for Valmet (Finland) and CNH (Italy) tractors. Thus, local manufacturing especially of equipment has become an important element of mechanization in Tanzania and at a region level as a whole (Shetto, 2005). There are however, very few local, formal manufacturers of agricultural equipment in East Africa and most of them manufacture to order. The Ndume Factory, one of the largest players in Kenya, manufactures equipments ranging from airport handling equipment to pneumatic seeder and cultivation machinery. However, recently, machinery manufacturers from China, India and Iran have established local manufacturing in East Africa. For example, a company known as Ugiran (Uganda-Iran) Company has been established. Similar enterprises are being set up in other countries while many other types of equipment manufacturers from Asia are establishing importation and distribution operations. This is especially, for power tillers, water pumps and post harvesting equipments. It is imperative to note that opportunities for growth in agricultural mechanization in East Africa have been recognized by a private sector. They are now involved in many aspects including hire services for mechanization implements and equipments.

On other hand all of the Southern African countries have diversified support structures consisting of public, private, donor communities and non-governmental that service agricultural mechanization sector.

Mechanization farming in Tanzania

The Mechanization Department of the Ministry of Agriculture, estimated that during 2010, there were 8,466 tractors in use in Tanzania, in a country with 11.5 million hectares of arable land. Based on this estimate, there were only 7 tractors per 100 sq. km of arable land in Tanzania, while Kenya and South Africa have 27 and 43 tractors per sq. km, respectively. Starting in 2009 and 2010, the number of tractors imported more than doubled. At this time, the government had disengaged itself from direct commercial activities in the mechanization sector, opening a door for the private sector to operate and distribute tractors. Still, a few limited public programs still remain in operation. In 2011, 1,800 Farmtrac tractors and 400 power tillers were imported by the government with a soft loan financed by the government of India. The private sector expressed concern regarding the government's interest in re-entering the mechanization sector in a large scale.



Since the sector opened up, private companies have set up distributorships of various tractor brands, and there are about 10-12 major importers of tractors in Tanzania. The large farms are their main client, in addition to farmer groups or savings and credit cooperatives that have access to subsidized financing from public banks or donor financed programs. The private sector foresees increased demand for tractors in Tanzania; but, it considers access to finance as a major constraint to farmers interested in purchasing tractors. Moreover, for a tractor service market to work efficiently, it is critical that there are tractor hire services and support services that are easily available to provide regular maintenance. Another thing is that most

Table 2: Trends of Tractors in Use in Tanzania

Year	1995	1997	1999	2001	2003	2005	2007	...	2010
Tractors	7,525	10,435	14,345	18,255	21,300	21,500	21,500		8,466

Source: World Bank Indicators Tanzania -Agricultural Production, 2012-04-19

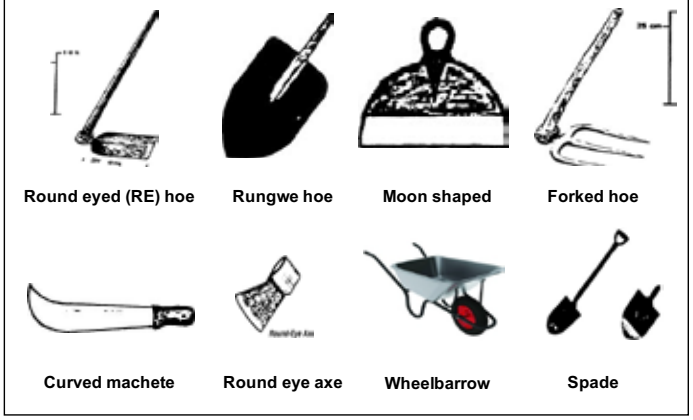
of tractor distributors are mainly based in Dar es Salaam with only few operators in rural areas. Spare parts are not accessible on a timely basis and when available are too costly. Because of their expense, tractors are not easily affordable to small scale farmers, unless they are provided with a low interest loan (World Bank, 2012).

As for other power, besides tractors, it was estimated that there were about 14 million hand hoes in use, 585,244 animal drawn ploughs and 1.3 million oxen (Shetto, 2008). The Tanzanian agricultural policy recognized that the small-scale farming was the dominant mode of agriculture and that, the farming in villages need modernization, rather than the current traditional state. It states that, increasing the output and the efficiency of agricultural production in the villages is central to increasing national output. The policy is strongly oriented towards mechanized agriculture. A shift from hand tools to animal drawn implements and from those to tractor drawn implements is therefore required. An immediate objective is to achieve national food self-sufficiency as well as agricultural production for the industrial sector and increased earnings from export crops. The major task is to move the farmers from hand tools to the use of animal and mechanically assisted implements.

The policy strongly expresses support for research, testing and extension services. Imports shall only consist of evaluated and tested equipment and local production of agricultural equipment shall be stepped up to meet the growing local demand. Ox-ploughing shall be spread and that new ox-ploughing implements, which use ox and donkey carts are encouraged. Repair facilities in the villages shall be improved and promoted. All this has to be undertaken hand in hand towards the final mechanization step that ends in the fully use of tractor drawn implements in all of agro-activities, in Tanzania.

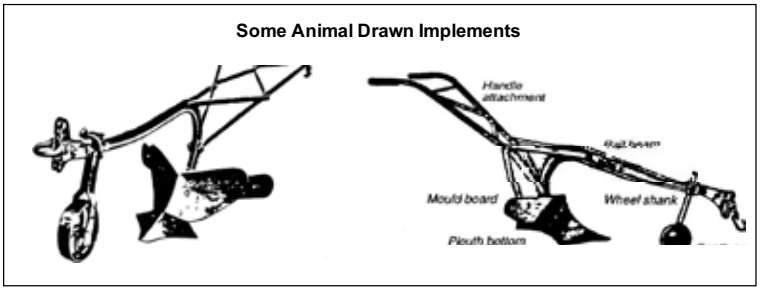
Draught Power Animals (DAP) in Tanzania

Some Hand Tools used by Smallholders



Hand Hoe and the Knapsack Sprayer

Some Animal Drawn Implements



Ox-carts with Seedcotton at Buying Post in Tanzania

Some Tractor Drawn Implements

An overview of mechanization in cotton producing areas of Tanzania

Tanzania is one of the largest cotton producers in Sub Saharan Africa. After struggling for several years, production of seed-cotton reached record levels in 2004/2005 and 2005/2006 farming seasons. In both years according to ICAC records, Tanzania ranked as the 6th largest cotton producer in Africa. In the coming marketing season of 2018/2019, Tanzania anticipates production of more than one million bales, as a result of sensitized farmers, fair weather and generally a positive government political will, among others. This level of cotton production will make historical records for the volumes of cotton crop in the country.

Within Tanzania cotton vies as one of the three most important cash crops, the other two being coffee and cashew nuts. In 2004/2005 however, cotton was the largest export earner of all agricultural commodities.

Generally, more than 90 percent of all Tanzanian Cotton is produced in the Lake zone, designated as the Western Cotton Growing Areas (WCGA). The other area where cotton is produced is the Eastern Cotton Growing Area (ECGA).

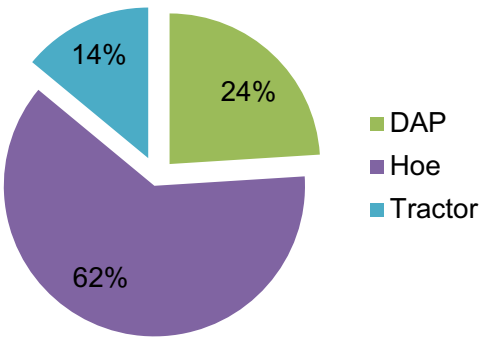
At about 450,000 hectares under cotton in a typical year, Tanzania has one of the largest areas in Africa. Thus, the way forward, lies in cotton farm mechanization, which will reduce drudgery and release labor from cotton farming to other productive activities. The farming system includes aspects such as farming methods employed by farmers, like the use of the hand hoe, animal traction (ox-plough), and tractors, for ridge or flat seedbed tillage. These have implications on cotton production and productivity.

Ownership of tools, mostly draught animals and some as small as knapsack sprayers, were shown to improve cotton productivity, which was observed to be very low (Sonda *et al.,* 2011). The households that owned draught animals and plough as well as sprayers were better positioned to undertake early or timely operations such as tillage, weeding and cotton spraying, to control pests.

In Tanzania cotton is predominantly grown by smallholder farmers. The size of cotton farms ranges from 0.2 to 20 hectares, with a national average yield of 750 kg/ha. All cotton crop production is rainfed and the total cotton sown area varies between 350,000 to 450,000 hectares. The size of area in a particular season depends on, the farm-gate prices in the preceding season and/or weather conditions, amongst others.

Farmers mainly prepare their land using hand hoes and animal drawn implements and a few use tractors. Seeding of cotton is done by hand hoes. Fertilizers are rarely used. Weed control is done by hand hoes. Farmers should weed their farms at least three times in the growing season to achieve a good crop of cotton. The cotton crop is wholly handpicked.

Level of Farm Mechanization in Western Cotton Growing Areas (WCGAs) of Tanzania



Manual Cotton Farm Operations





Cotton Transport from the Buying Posts to the Ginnery



Seedcotton arrival | Unloading | Inspection

An official cotton marketing season is inaugurated in early June. After opening the ginners purchases seedcotton from the farmers and transport it to their ginneries for ginning.

Ginnery in Tanzania

Tanzania Cotton has both Saw and Roller at 50-50

Saw gins

Roller gins

Trucks Waiting to be Loaded with Bales for Export

More than 75% of all Tanzanian cotton is for export

Dar es Salaam Port

Tanzanian cotton is exported through the Dar es salaam port

In cotton agro-processing (mechanization), Tanzania has more than 100 ginneries. The estimated total capacity of existing ginneries in the country is more than one million bales. About 70% of this capacity was utilized in the peak production season of 2005/2006 with 700,000 bales of lint produced (Poulton and Maro, 2007). There is no doubt that this ginning capacity will match with the impending bumper cotton crop in coming/current farming season of 2018/2019.

Conclusion

It had been shown that there are farm mechanization challenges in all of the Eastern and Southern Africa (ESA) countries that had been approached by public, private and donors in various ways at different periods. All these efforts were without much success. These should be dealt with, in order for farm mechanization to be profitable and sustainable to smallholder farmers. On the other side there are opportunities for mechanization that have to be capitalized on. In rural smallholder farm mechanization, the sustainability of the projects and the appropriateness of the technologies are paramount. An effective supply chain of machinery implies a synergistic relationship between the smallholders who are the customers and mechanization service-providers.

In Tanzania, the supply chain comprises both private and public actors, with sometimes different activities but having the same vision to make sure that the train runs on the right track. One aspect of medium and smallholder farmers that is constantly mentioned by importers or local manufacturers and retailers is their limited ability to invest in agricultural equipment. The helpful provision of credit at moderate interest rates has been highlighted by many non-bank organizations, but the advantages of sharing machinery ownership in groups of farmers has been seen as positive to support farmers to access them.

Looking at the youth unemployment in Africa it is imperative to make agriculture attractive. Agriculture is still the largest employer in the continent stands tall among other sectors with the capacity to address employment of many graduates.

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2016/17 Supply and Use of Cotton by Country April 1, 2018

	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	0	0		0	0.11	0.11
CUBA	4	269	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	104	1,575	164	168	230	420	33	109	0.24	0.26
USA	3,848	972	3,738	827	2	708	3,248	599	0.15	0.85
N. America	**3,961**	**986**	**3,905**	**996**	**235**	**1,133**	**3,281**	**709**	**0.16**	**0.63**
EL SALVADOR				9	34	34		9	0.27	0.27
GUATEMALA				7	26	26		7	0.27	0.27
HONDURAS	0	318	0	0				0		
C. America	**2**	**512**	**1**	**16**	**60**	**61**	**0**	**16**	**0.27**	**0.27**
ARGENTINA	247	727	180	320	3	143	58	301	1.50	2.10
BOLIVIA	4	639	3	2	0	3	0	2	0.50	0.53
BRAZIL	939	1,629	1,530	884	41	690	607	1,158	0.89	1.68
CHILE				0	0	0		0	0.41	0.41
COLOMBIA	9	856	8	16	28	43	1	7	0.17	0.17
ECUADOR	1	439	1	3	10	11		3	0.25	0.25
PARAGUAY	10	450	5	1	1	3	3	1	0.21	0.41
PERU	27	814	22	16	36	57	1	16	0.28	0.28
URUGUAY				0		0		0	0.06	0.06
VENEZUELA	15	390	6	4	4	10		3	0.30	0.30
S. America	**1,252**	**1,400**	**1,752**	**1,247**	**124**	**961**	**670**	**1,492**	**0.91**	**1.55**
ALGERIA				1	1	2		0	0.03	0.03
EGYPT	55	694	38	93	111	127	26	90	0.59	0.71
MOROCCO				4	15	15		4	0.24	0.24
SUDAN	70	561	39	20		18	28	14	0.31	0.78
TUNISIA				3	12	12		3	0.22	0.22
N. Africa	**125**	**620**	**78**	**120**	**140**	**174**	**54**	**110**	**0.49**	**0.64**
BENIN	418	416	174	58		4	142	87	0.60	21.78
BURKINA FASO	740	385	285	85		4	247	120	0.48	29.93
CAMEROON	224	488	109	64		2	113	58	0.50	30.53
CENT. AFR. REP.	32	216	7	2			7	3	0.42	
CHAD	298	239	71	23		1	42	51	1.19	102.19
COTE D'IVOIRE	343	408	140	19	0	2	136	21	0.15	10.25
GUINEA	12	276	3	1			3	1	0.40	
MADAGASCAR				3				3		
MALI	656	404	265	86		5	240	106	0.43	21.20
NIGER	5	447	2	0		1	1	0	0.11	0.25
SENEGAL	20	355	7	1		1	5	3	0.41	3.23
TOGO	133	293	39	12			38	14	0.36	
F. Africa	**2,881**	**383**	**1,103**	**358**	**0**	**19**	**975**	**467**	**0.47**	**24.33**
ANGOLA	3	302	1	0		1	0	0	0.33	0.48
ETHIOPIA	82	423	35	19	20	55	0	19	0.34	0.34
GHANA	15	370	6	9	0	1	1	12	4.42	9.33
KENYA	29	183	5	2	3	8		3	0.36	0.36
MALAWI	90	232	21	10		3	16	12	0.61	3.94
MOZAMBIQUE	116	263	31	26			37	20	0.53	
NIGERIA	253	202	51	22	1	25	31	18	0.32	0.71
SOUTH AFRICA	18	875	16	9	18	22	9	12	0.37	0.52
TANZANIA	331	123	41	69		39	30	40	0.58	1.03
UGANDA	72	388	28	21		1	32	16	0.49	18.33
CONGO, DR				2	8	8		2	0.27	0.27
ZAMBIA	120	332	40	40		2	44	34	0.76	
ZIMBABWE	155	271	42	7		3	24	22	0.83	7.83
S. Africa	**1,304**	**245**	**319**	**242**	**71**	**191**	**226**	**215**	**0.52**	**1.13**
KAZAKHSTAN	111	634	70	13	0	12	55	16	0.24	1.35
KYRGYZSTAN	14	810	12	4	4	1	14	4	0.27	4.19
TAJIKISTAN	162	525	85	27		11	74	27	0.32	2.40
TURKMENISTAN	545	542	296	74		140	143	86	0.30	0.61
UZBEKISTAN	1,250	631	789	242	1	371	403	259	0.34	0.70
C. Asia	**2,082**	**601**	**1,252**	**360**	**5**	**535**	**689**	**392**	**1.47**	**0.73**

2016/17 Supply and Use of Cotton by Country (cont'd) April 1, 2018

	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				0	4	3	1	1	0.14	0.17
AZERBAIJAN	51	626	32	9		16	10	15	0.59	0.96
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				2	7	3	4	1	0.18	0.40
BULGARIA	1	324	0	1	5	5	0	1	0.18	0.19
CZECH REP.				0	3	3		0	0.13	0.13
DENMARK					0	0				
ESTONIA										
FINLAND										
FRANCE				2	12	9	3	2	0.13	0.18
GERMANY				9	30	24	6	9	0.30	0.38
GREECE	211	1,009	213	44	6	20	223	20	0.08	1.00
HUNGARY				0	1		1	0	0.03	
IRELAND				0	0	0		0	0.09	0.09
ITALY				7	34	33	2	6	0.18	0.19
LATVIA				0	0	0	0	0	0.03	0.04
LITHUANIA				0				0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	4	4		0	0.10	
NORWAY										
POLAND				0	3	3		0	0.12	0.12
PORTUGAL				7	34	34	0	6	0.18	0.19
ROMANIA				0	0	0		0	0.09	0.09
RUSSIA	1	520	1	16	51	55	0	13	0.24	0.24
SLOVAK REP.										
SPAIN	61	903	55	23	3	5	56	20	0.32	3.74
SWEDEN				0	0	0		0	0.74	0.74
SWITZERLAND				0	1	1	0	0	0.17	0.29
UKRAINE				0	2	2		0	0.25	0.25
UNITED KINGDOM				0	0	0		0	0.14	0.14
FORMER YUGOSLAVIA				1	7	7		1	0.19	0.19
Europe	**327**	**922**	**301**	**130**	**222**	**243**	**306**	**103**	**0.19**	**0.42**
Including EU-28	**273**	**982**	**268**	**97**	**147**	**149**	**295**	**68**	**0.15**	**0.45**
CHINA	2,923	1,676	4,900	12,650	1,096	8,000	13	10,632	1.33	1.33
TAIWAN				41	140	153		29	0.19	0.19
HONG KONG				30	1	0	0	30	62.05	
Sub total	**2,923**	**1,676**	**4,900**	**12,722**	**1,237**	**8,154**	**13**	**10,691**	**1.31**	**1.31**
AUSTRALIA	557	1,670	931	180		7	812	292	0.36	43.70
INDONESIA	8	615	5	96	746	700		147	0.21	0.21
JAPAN				16	56	62		9	0.15	0.15
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				54	232	229	1	56	0.24	0.24
MALAYSIA				17	85	65	24	13	0.15	0.20
PHILIPPINES	0	567	0	3	14	13		4	0.31	0.31
SINGAPORE				0	7		7	0	0.05	
THAILAND	2	517	1	46	267	261	0	52	0.20	0.20
VIETNAM	2	750	1	149	1,198	1,168		181	0.16	0.16
E. Asia	**588**	**1,609**	**945**	**565**	**2,610**	**2,516**	**845**	**759**	**0.23**	**0.30**
AFGHANISTAN	40	387	16	5		4	10	7	0.48	1.56
BANGLADESH	43	665	28	346	1,412	1,409		379	0.27	0.27
INDIA	10,845	541	5,865	1,507	596	5,148	991	1,829	0.30	0.36
MYANMAR	244	634	155	104	10	207		62	0.30	0.30
PAKISTAN	2,496	666	1,663	704	538	2,147	24	734	0.34	0.34
SRI LANKA				0	2	2		0	0.09	0.09
S. Asia	**13,671**	**565**	**7,729**	**2,667**	**2,558**	**8,919**	**1,024**	**3,011**	**0.30**	**0.34**
IRAN	75	702	53	33	66	110	0	42	0.38	0.38
IRAQ	13	361	5	2	4	9		2	0.21	0.21
ISRAEL	8	1,761	14	2			14	2	0.13	
SYRIA	35	983	35	22		24	22	11	0.23	0.45
TURKEY	420	1,674	703	826	801	1,455	73	802	0.53	0.55
Sub total	**554**	**1,462**	**810**	**889**	**882**	**1,610**	**109**	**861**	**0.50**	**0.53**
WORLD TOTAL	**29,671**	**778**	**23,095**	**20,312**	**8,142**	**24,516**	**8,191**	**18,828**	**0.77**	**0.77**

*/ Ending stocks divided by consumption plus exports.
**/ Ending stocks divided by consumption.
Subtotals and total include countries not shown.

2017/18 Supply and Use of Cotton by Country April 1, 2018

	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	0	0		0	0.12	0.12
CUBA	4	269	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	212	1,580	335	109	175	435	62	122	0.25	0.28
USA	4,616	992	4,579	599	2	729	3,201	1,250	0.32	1.71
N. America	**4,837**	**1,016**	**4,916**	**709**	**181**	**1,170**	**3,263**	**1,373**	**0.31**	**1.17**
EL SALVADOR				9	35	35		9	0.27	0.27
GUATEMALA				7	27	27		7	0.26	0.26
HONDURAS	0	318	0	0				0		
C. America	**2**	**512**	**1**	**16**	**62**	**63**	**0**	**16**	**0.26**	**0.26**
ARGENTINA	304	658	200	301	3	145	87	273	1.18	1.89
BOLIVIA	4	639	3	2	1	3	0	2	0.50	0.53
BRAZIL	1,050	1,622	1,703	1,158	10	725	880	1,267	0.79	1.75
CHILE				0	0	0		0	0.41	0.41
COLOMBIA	11	949	11	7	35	45	1	7	0.16	0.16
ECUADOR	1	439	1	3	10	10		3	0.31	0.31
PARAGUAY	10	419	4	1	1	3	2	1	0.26	0.43
PERU	26	814	22	16	40	60	1	17	0.28	0.28
URUGUAY				0	0	0		0	0.06	0.06
VENEZUELA	14	390	6	3	5	11		3	0.30	0.30
S. America	**1,423**	**1,370**	**1,949**	**1,492**	**105**	**1,002**	**971**	**1,574**	**0.80**	**1.57**
ALGERIA				0	2	2		0	0.04	0.04
EGYPT	91	746	68	90	119	139	50	88	0.46	0.63
MOROCCO				4	15	15		4	0.24	0.24
SUDAN	84	561	47	14		18	27	16	0.36	0.90
TUNISIA				3	12	12		3	0.22	0.22
N. Africa	**175**	**658**	**115**	**110**	**148**	**186**	**77**	**110**	**0.42**	**0.59**
BENIN	450	436	196	87		4	164	115	0.69	28.86
BURKINA FASO	759	373	283	120		4	249	150	0.59	37.44
CAMEROON	235	502	118	58		2	108	66	0.61	34.89
CENT. AFR. REP.	33	219	7	3			7	3	0.49	
CHAD	150	200	30	51		1	56	24	0.43	48.73
COTE D'IVOIRE	326	427	139	21		2	99	59	0.59	28.99
GUINEA	12	273	3	1			3	1	0.40	
MADAGASCAR				3				3		
MALI	730	416	304	106		5	252	153	0.60	30.63
NIGER	5	447	2	0		1	1	0	0.11	0.25
SENEGAL	19	330	6	3		1	5	3	0.48	3.67
TOGO	144	303	44	14			40	17	0.44	
F. Africa	**2,863**	**396**	**1,133**	**467**		**19**	**984**	**596**	**0.59**	**31.10**
ANGOLA	3	301	1	0		1	0	0	0.33	0.48
ETHIOPIA	60	633	38	19	25	60	3	19	0.29	0.31
GHANA	15	372	6	12		1	4	12	2.14	9.33
KENYA	25	184	5	3	4	8		3	0.41	0.41
MALAWI	90	236	21	12		3	18	12	0.56	3.95
MOZAMBIQUE	124	185	23	20			28	15	0.52	
NIGERIA	261	204	53	18	1	24	28	20	0.38	0.84
SOUTH AFRICA	19	2,100	39	12	6	28	10	20	0.52	0.71
TANZANIA	347	294	102	40		43	17	82	1.36	1.91
UGANDA	77	351	27	16		1	24	19	0.76	21.16
CONGO, DR				2	7	7		2	0.30	0.30
ZAMBIA	126	356	45	34		2	41	36	0.85	
ZIMBABWE	202	266	54	22		3	39	34	0.80	11.91
S. Africa	**1,370**	**304**	**417**	**215**	**64**	**203**	**214**	**279**	**0.67**	**1.37**
KAZAKHSTAN	116	634	73	16	0	13	42	34	0.63	2.64
KYRGYZSTAN	14	810	11	4	3	1	13	4	0.28	4.19
TAJIKISTAN	187	532	100	27		15	78	34	0.36	2.29
TURKMENISTAN	545	559	304	86		140	159	91	0.30	0.65
UZBEKISTAN	1,208	662	800	259	1	389	344	326	0.45	0.84
C. Asia	**2,069**	**622**	**1,288**	**392**	**4**	**558**	**637**	**490**	**2.02**	**0.88**

2017/18 Supply and Use of Cotton by Country (cont'd) April 1, 2018

	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				1	3	3		1	0.18	0.18
AZERBAIJAN	139	537	75	15		17	39	34	0.61	2.00
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				1	7	3	4	1	0.19	0.42
BULGARIA	1	324	0	1	5	5	0	1	0.18	0.19
CZECH REP.				0	2	2		0	0.09	0.09
DENMARK					0	0			0.12	
ESTONIA										
FINLAND										
FRANCE				2	10	8	2	2	0.15	0.19
GERMANY				9	26	22	4	9	0.34	0.41
GREECE	243	1,028	250	20	6	20	218	38	0.16	1.93
HUNGARY				0				0		
IRELAND				0	0	0		0	0.10	0.10
ITALY				6	33	32	2	6	0.19	0.20
LATVIA				0	0	0	0	0	0.03	0.04
LITHUANIA				0				0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	4	4		0	0.11	
NORWAY										
POLAND				0	3	3		0	0.12	0.12
PORTUGAL				6	31	32		5	0.15	0.15
ROMANIA				0	0	0		0	0.09	0.09
RUSSIA	1	520	1	13	47	49	0	11	0.23	0.23
SLOVAK REP.										
SPAIN	62	939	58	20	3	7	54	20	0.32	2.64
SWEDEN				0	0	0		0		
SWITZERLAND				0	1	0	0	0	0.19	0.32
UKRAINE				0	2	2		0	0.26	0.26
UNITED KINGDOM				0	0	0		0	0.13	0.13
FORMER YUGOSLAVIA				1	7	7		1	0.19	0.19
Europe	**447**	**858**	**384**	**103**	**207**	**235**	**322**	**136**	**0.24**	**0.58**
Including EU-28	**306**	**1,008**	**308**	**68**	**137**	**145**	**283**	**84**	**0.20**	**0.58**
CHINA	3,157	1,693	5,345	10,632	1,387	8,115	14	9,236	1.14	1.14
TAIWAN				29	153	153		29	0.19	0.19
HONG KONG				30	1	0	0	30	61.83	
Sub total	**3,157**	**1,693**	**5,345**	**10,691**	**1,541**	**8,269**	**14**	**9,294**	**1.12**	**1.12**
AUSTRALIA	500	1,936	968	292		6	933	321	0.34	50.45
INDONESIA	8	615	5	147	792	742		202	0.27	0.27
JAPAN				9	57	58		8	0.14	0.14
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				56	258	236		78	0.33	0.33
MALAYSIA				13	88	67	23	11	0.12	0.16
PHILIPPINES	0	567	0	4	13	13		4	0.31	0.31
SINGAPORE				0	6		6	0	0.05	
THAILAND	2	517	1	52	327	299		82	0.27	0.27
VIETNAM	2	750	1	181	1,459	1,314		328	0.25	0.25
E. Asia	**528**	**1,858**	**982**	**759**	**3,005**	**2,745**	**962**	**1,038**	**0.28**	**0.38**
AFGHANISTAN	38	387	15	7		4	12	5	0.31	1.20
BANGLADESH	45	764	34	379	1,602	1,444		571	0.40	0.40
INDIA	12,235	507	6,200	1,829	330	5,302	972	2,085	0.33	0.39
MYANMAR	249	634	158	62	57	207		69	0.34	0.34
PAKISTAN	3,097	580	1,796	734	323	2,346	46	461	0.19	0.20
SRI LANKA				0	2	2		0	0.09	0.09
S. Asia	**15,668**	**524**	**8,205**	**3,011**	**2,314**	**9,308**	**1,031**	**3,192**	**0.31**	**0.34**
IRAN	79	709	56	42	70	116		52	0.45	0.45
IRAQ	10	361	3	2	5	8		2	0.24	0.24
ISRAEL	7	1,892	13	2			13	2	0.14	
SYRIA	25	954	23	11		22	4	9	0.34	0.39
TURKEY	462	1,817	840	802	823	1,481	46	938	0.61	0.63
Sub total	**585**	**1,601**	**936**	**861**	**907**	**1,638**	**62**	**1,005**	**0.59**	**0.61**
WORLD TOTAL	**33,123**	**775**	**25,671**	**18,828**	**8,536**	**25,395**	**8,536**	**19,103**	**0.75**	**0.75**

*/ Ending stocks divided by consumption plus exports.
**/ Ending stocks divided by consumption.
Subtotals and total include countries not shown.

2018/19 Supply and Use of Cotton by Country April 1, 2018

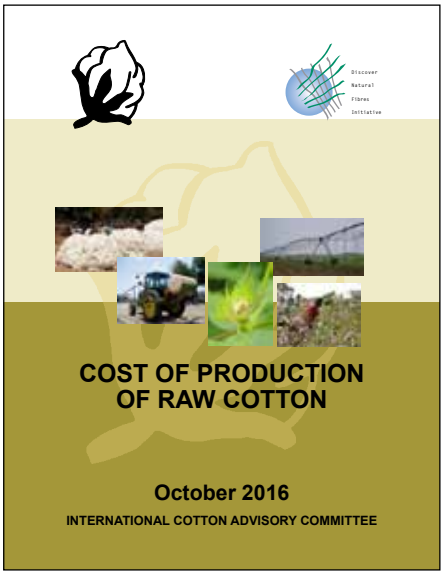
	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
CANADA				0	0	0		0	0.12	0.12
CUBA	4	269	1	1	2	3		1	0.19	0.19
DOM. REP.					1	1		0	0.47	0.47
MEXICO	202	1,587	320	109	175	435	60	122	0.25	0.28
USA	4,869	868	4,227	599	2	737	3,492	1,250	0.32	1.70
N. America	**5,080**	**895**	**4,549**	**709**	**181**	**1,177**	**3,553**	**1,373**	**0.31**	**1.17**
EL SALVADOR				9	35	35		9	0.27	0.26
GUATEMALA				7	27	27		7	0.26	0.26
HONDURAS	0	318	0	0				0		
C. America	**1**	**522**	**1**	**16**	**62**	**63**		**16**	**0.26**	**0.26**
ARGENTINA	305	662	202	301	3	146	102	229	1.18	1.57
BOLIVIA	4	640	3	2	1	3	0	2	0.50	0.53
BRAZIL	1,155	1,399	1,616	1,158	10	728	898	1,267	0.79	1.74
CHILE				0	0	0		0	0.41	0.41
COLOMBIA	10	950	10	7	36	45	1	7	0.16	0.16
ECUADOR	1	439	1	3	10	11		3	0.31	0.31
PARAGUAY	10	420	4	1	2	3	2	3	0.26	1.35
PERU	27	819	22	16	38	59	1	17	0.28	0.28
URUGUAY				0	0	0		0	0.06	0.06
VENEZUELA	15	392	6	3	5	10		3	0.30	0.30
S. America	**1,528**	**1,219**	**1,864**	**1,492**	**105**	**1,006**	**1,004**	**1,532**	**0.80**	**1.52**
ALGERIA				0	1	1		0	0.04	0.05
EGYPT	100	805	81	90	120	137	64	88	0.46	0.64
MOROCCO				4	14	14		4	0.24	0.25
SUDAN	88	702	62	14		18	44	16	0.36	0.89
TUNISIA				3	12	12		3	0.22	0.22
N. Africa	**188**	**757**	**142**	**110**	**148**	**182**	**108**	**110**	**0.42**	**0.60**
BENIN	432	501	216	87		4	220	108	0.69	27.05
BURKINA FASO	770	392	302	120		4	297	151	0.59	37.70
CAMEROON	225	501	113	58		2	121	56	0.61	29.74
CENT. AFR. REP.	32	251	8	3			7	4	0.49	
CHAD	144	230	33	51		1	52	5	0.43	10.35
COTE D'IVOIRE	313	440	138	21		2	126	69	0.59	33.76
GUINEA	12	286	3	1			3	2	0.40	
MADAGASCAR				3				3		
MALI	701	419	293	106		5	295	147	0.60	29.33
NIGER	4	469	2	0		1	1	0	0.11	0.25
SENEGAL	18	347	6	3		1	5	3	0.48	4.11
TOGO	138	318	44	14			39	22	0.44	
F. Africa	**2,790**	**415**	**1,159**	**467**		**19**	**1,166**	**571**	**0.59**	**29.75**
ANGOLA	3	304	1	0		1	0	0	0.33	0.48
ETHIOPIA	58	487	28	19	25	62	0	10	0.29	0.15
GHANA	15	373	5	12		1	4	12	2.14	9.28
KENYA	25	221	6	3	4	8	1	3	0.41	0.41
MALAWI	86	248	21	12		3	18	12	0.56	3.99
MOZAMBIQUE	119	204	24	20			26	13	0.52	
NIGERIA	250	205	51	18	1	24	28	20	0.38	0.84
SOUTH AFRICA	18	2,210	39	12	3	28	15	20	0.52	0.70
TANZANIA	333	216	72	40		44	65	46	1.36	1.05
UGANDA	74	369	27	16		1	36	9	0.76	10.42
CONGO, DR				2	7	7		2	0.30	0.30
ZAMBIA	121	392	47	34		2	50	32	0.85	
ZIMBABWE	193	292	57	22		3	52	36	0.80	12.66
S. Africa	**1,316**	**291**	**383**	**215**	**60**	**206**	**295**	**221**	**0.67**	**1.07**
KAZAKHSTAN	113	665	75	16	0	13	58	38	0.63	2.89
KYRGYZSTAN	14	851	12	4	3	1	13	5	0.28	4.79
TAJIKISTAN	191	535	102	27		15	85	36	0.36	2.43
TURKMENISTAN	534	561	300	86		141	143	106	0.30	0.75
UZBEKISTAN	1,209	665	804	259	1	409	440	283	0.45	0.69
C. Asia	**2,061**	**627**	**1,293**	**392**	**4**	**579**	**740**	**468**	**2.02**	**0.81**

2018/19 Supply and Use of Cotton by Country (cont'd) April 1, 2018

	Area	Yield	Prod	Beg Stocks	Imports	Cons	Exports	End Stocks	S/U *	S/MU **
	000 Ha	Kgs/Ha	000 Metric Tons						Ratio	Ratio
AUSTRIA				1	3	3		1	0.18	0.18
AZERBAIJAN	143	672	96	15		20	66	44	0.61	2.13
BELARUS				4	11	11		4	0.34	0.34
BELGIUM				1	7	3	4	1	0.19	0.43
BULGARIA	1	324	0	1	6	6	0	1	0.18	0.17
CZECH REP.				0	2	2		0	0.09	0.04
DENMARK					0	0			0.12	
ESTONIA										
FINLAND										
FRANCE				2	9	8	1	1	0.15	0.17
GERMANY				9	24	21	4	8	0.34	0.36
GREECE	238	1,034	246	20	6	20	232	38	0.16	1.94
HUNGARY				0				0		
IRELAND				0	0	0		0	0.10	0.11
ITALY				6	32	30	2	6	0.19	0.20
LATVIA				0	0	0	0	0	0.03	0.04
LITHUANIA				0				0		
MOLDOVA				1	2	2		1	0.34	0.34
NETHERLANDS				0	4	4		0	0.11	
NORWAY										
POLAND				0	3	3		0	0.12	0.13
PORTUGAL				6	30	31		4	0.15	0.14
ROMANIA				0	0	0		0	0.09	0.10
RUSSIA	1	523	1	13	48	48	0	12	0.23	0.24
SLOVAK REP.										
SPAIN	61	933	57	20	3	7	54	17	0.32	2.42
SWEDEN				0	0	0		0		
SWITZERLAND				0	1	0	0	0	0.19	0.33
UKRAINE				0	2	2		0	0.26	0.26
UNITED KINGDOM				0	0	0		0	0.13	0.12
FORMER YUGOSLAVIA				1	7	7		1	0.19	0.19
Europe	**456**	**831**	**379**	**103**	**207**	**214**	**219**	**159**	**0.37**	**0.74**
Including EU-28	**300**	**1,011**	**303**	**68**	**131**	**141**	**283**	**80**	**0.19**	**0.57**
CHINA	3,157	1,693	5,345	10,632	1,852	8,358	14	8,062	1.14	0.96
TAIWAN				29	155	155		29	0.19	0.18
HONG KONG				30	0	0	0	30	61.83	
Sub total	**3,157**	**1,693**	**5,345**	**10,691**	**2,007**	**8,514**	**14**	**8,121**	**1.12**	**0.95**
AUSTRALIA	450	1,979	890	292		6	933	321	0.34	53.11
INDONESIA	8	618	5	147	776	760		223	0.27	0.29
JAPAN				9	56	57		7	0.14	0.13
KOREA, D.R.				1	5	5		1	0.24	0.24
KOREA, REP.				56	236	236		78	0.33	0.33
MALAYSIA				13	90	67	23	11	0.12	0.17
PHILIPPINES	0	570	0	4	13	13		4	0.31	0.32
SINGAPORE				0	6		6	0	0.05	
THAILAND	2	520	1	52	307	302		88	0.27	0.29
VIETNAM	2	754	1	181	1,429	1,399		359	0.25	0.26
E. Asia	**478**	**1,890**	**904**	**759**	**2,917**	**2,851**	**962**	**1,094**	**0.28**	**0.38**
AFGHANISTAN	36	387	14	7		4	12	4	0.31	0.90
BANGLADESH	45	768	35	379	1,554	1,588		571	0.40	0.36
INDIA	11,895	511	6,073	1,829	347	5,567	972	2,085	0.33	0.37
MYANMAR	239	637	152	62	55	207		69	0.34	0.34
PAKISTAN	3,328	629	2,093	734	590	2,463	46	635	0.19	0.26
SRI LANKA				0	2	2		0	0.09	0.09
S. Asia	**15,547**	**538**	**8,369**	**3,011**	**2,547**	**9,834**	**1,031**	**3,365**	**0.31**	**0.34**
IRAN	71	710	50	42	65	116		52	0.45	0.45
IRAQ	9	362	3	2	5	8		2	0.24	0.24
ISRAEL	7	1,902	13	2			13	2	0.14	
SYRIA	18	958	18	11		14	4	9	0.34	0.61
TURKEY	467	1,826	852	802	831	1,703	46	854	0.61	0.50
Sub total	**575**	**1,631**	**937**	**861**	**911**	**1,852**	**62**	**922**	**0.48**	**0.50**
WORLD TOTAL	**33,167**	**764**	**25,347**	**18,828**	**9,144**	**26,516**	**8,536**	**17,934**	**0.75**	**0.68**

*/ Ending stocks divided by consumption plus exports.
**/ Ending stocks divided by consumption.
Subtotals and total include countries not shown.

COST OF PRODUCTION OF RAW COTTON



The report includes data by country for the 2015/16 season. Many countries are reporting data by region or type of cotton. This study is the only source of comparative information on the cost of cotton production in the world.

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