More Crop Per Drop

WATER REPORT ON THE COTTON INDUSTRY

Working with smallholder farmers to increase yield and maximise water efficiency in the cotton industry





Executive Summary

otton is a hugely important and significant crop. A growing population continues to purchase a wide range of cotton fabrics and textiles at a fast growing rate. In fact, cotton is still the most widely used natural fibre used in clothing today.

And more than 100 million smallholder farmers and their families rely on cotton for a living, with 90% of those farmers living in the developing world, according to WWF.

But cotton faces significant sustainability risks and challenges, not least its reliance on water and the impact of climate change. For every t-shirt made, around 2,700 litres of water is used across the supply chain from farm to fashion, inclusive of water consumed end to end from agricultural processes to Textile processing to convert fibre to final finished product – the same amount of water the average person drinks in three years; it is certainly a thirsty crop.

The urgent need for climate change adaptation and better use of increasingly limited water resources puts pressure on the cotton industry.

As the World Economic Forum notes, water security is "one of the most tangible and fastest-growing social, political and economic challenges faced today". The world is likely to face a 40% global shortfall between forecast demand and available supply of water in the next 15 years.

But with basic interventions, such as training and education, smallholder farmers can dramatically save water by adopting more sustainable agricultural practices. However, many farmers do not have access to basic information when it comes to best practice for water use and conservation. Educating and empowering farmers and helping them gain access to finance help remove barriers to progress that need to be addresses urgently.

Through its farmer training programmes, CottonConnect has proven that simple and basic techniques can help farmers reduce their water impact by as much as 30%. And by installing simple technologies such as drip irrigation systems, savings of up to 60% can be achieved.

As World Water Week kicks off in Stockholm, the water debate is in the spotlight. Major global corporates are helping to raise the profile of today's most pressing water challenges with a range of multi-million pound watersaving programmes and initiatives.



Through its farmer training programmes, working with around 130,000 smallholder farmers in India, China and Pakistan, CottonConnect has proven that simple and basic techniques can help farmers reduce their water impact by as much as 30%. And by installing simple technologies such as drip irrigation systems, savings of up to 60% can be achieved.

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But the other end of the supply chain is often overlooked. With 100 million farmers growing cotton globally, the impact that can be had through providing access to learning and basic technologies is significant. Companies, NGOs, governments and international development agencies must not forget

the farmers on the ground that need the help and support of all stakeholders if they are to run more efficient and sustainable operations.

Failure to connect all parts of the supply chain will put the future of cotton at risk.

To create a sustainable cotton industry, we are calling for brands and retailers to get involved. We need corporate organisations to collaborate with organisations like CottonConnect to:

- Map and ensure greater transparency and better relationships across the supply chain;
- Take action to support basic interventions that can help smallholder farmers make up to 30% water savings (60% by investing in technologies such as drip irrigation);
- Collaborate and help to fund initiatives to help drive cotton supply chain sustainability at scale.



Through the report, we want to share best practice, invite more brands and retailers to get to grips with the water challenge, and call for greater collaboration and action to take these basic interventions to scale to sustain the future of the cotton industry.



1. Introduction

1.1 Cotton is big business

Some 20 million tonnes of cotton is produced every year in 90 countries – from China, the US to India, Pakistan and West Africa. Around 2.5% of all available arable land is under cotton production – some 35 million hectares – producing enough raw material to service current average worldwide consumption of 42 square meters of cotton per person per year, according to WWF.

It is an important industry to the livelihood and wellbeing of millions of farmers and their families, 90% of which live in the developing world. It's also a complex sector, relying on the efforts of more than 100 million smallholders that operate small pockets of land of less than two hectares.

But cotton has a problem.

It is an incredibly thirsty crop, accounting for more than 3% of the global water consumption used for all crop production.

According to Better Cotton Initiative, it can take about 10,000 litres of water to make one kilogramme of cotton. As the figure below shows, making one cotton T-shirt requires around 2,700 litres, the same amount of water the average person drinks during the course of three years.

In India, cotton cultivation accounts for using nearly 6% of water used for irrigation in agriculture across the country.

Water footprint of cotton products	Litres			
	Blue Water	Green Water	Grey Water	Total water
1 pair of jeans	4,900	4,450	1,500	10,850
1 cotton t-shirt	1,230	1,110	380	2,720
1 pair of diapers	370	330	110	810
1 cotton swab (Q-tip)	1.6	1.5	0.5	3.6

1.2 Water Scarcity is a Growing Problem

Cotton's demand for water is a problem that is not going to go away.

The growing population and increasing consumerism means that more people are buying more consumers goods, including cotton products such as fashion garments, footwear, towels and medical supplies.

According to the World Economic Forum, water security is "one of the most tangible and fastestgrowing social, political and economic challenges faced today". It argues that as the demand for water increases, the world will face a 40% global shortfall between forecast demand and available supply by 2030.

And water is becoming scarcer in the regions where cotton is most commonly grown, driven not least by the impacts of a changing climate and disruptive weather patterns. And non-food crops are constantly competing with food crops and livestock for this ever-depleting, finite resource.

WWF's 2003 report, 'Thirsty Crops', points to the fact that, although agriculture uses 70% of the world's water, rising to 90% in many developing countries, just 20-50% of the water withdrawn actually reaches the crops because it is often lost during transfer to the fields. It adds that big food-producing countries like China, India and Pakistan have reached or are close to reaching their renewable water resource limits. "Water tables are dropping by as much as 10 metres annually in the worst cases," it says.

The combination of poor and inefficient use of water in farming practices across the developing world, lack of access to education and sharing of best practice, and lack of access to finance to invest in new technologies is exacerbating the problem.

Brands and retailers that rely on the supply of cotton to create products sold in their stores across the world will ultimately bear the brunt of this water crunch. The cotton industry must better understand its water footprint and find ways to deal with it responsibly – not only for the environment and for consumers, but also for the wellbeing of the communities in which cotton is grown and manufactured.

And it is up to businesses and NGOs to support and work with the thousands of smallholder farmers to collaborate to tackle these water issues together.

CottonConnect has worked with more than 130,000 smallholder cotton farmers in India, Pakistan and China, over the past four years – supporting and collaborating with some of the brands that rely on cotton in their supply chain – to tackle these issues at farm level.

Section 2 highlights what has already worked, section 3 examines the barriers to farmers adopting more sustainable agricultural practices, and the final section sets out a series of actions for brands and retailers can take to help build a more resilient and sustainable future for cotton.



2. Working with smallholder farmers – What can be done?

2.1 Farmer Training Programmes – A Four-Step Approach to Dealing with Water

CottonConnect works with a specific four-step approach to effective water management in its farmer training programmes. This enables smallholder farmers to start to learn and implement

basic, yet effective, agricultural practices, and then move on to adopting technologies such as rainwater harvesting and drip irrigation.

STEP ONE Good Agricultural Practices (e.g. water management)

STEP TWO Sustainable Agricultural Practices (e.g. rainwater harvesting)

STEP THREE Modern Agricultural Practices (e.g. the use of sprinklers)

STEP FOUR Advanced Agricultural Practices (e.g. drip irrigation technology)

2.2 Adoption of Basic and Sustainable Agricultural Practices

Relatively small changes can make a significant impact on water usage and the drought resistance of the cotton crop.

Farmer training includes integrated water management designed to demonstrate how farmers can use sustainable ways to use less water to produce their cotton yield. For example, in India, simple interventions such as burrow irrigation, green mulching, plastic mulching and soil conservation

have resulted in significant water usage reduction, sometimes by as much as 30%.

In many cases farmers haven't been shown basic techniques before and so there is a need to build the capacity of farmers to take small steps on their farms.

BASIC AGRICULTURAL PRACTICES ADOPTED IN INDIA

n Maharashtra, a western region of India, which has more than 110 million inhabitants, a falling water table due to excessive water use has left farmers vulnerable.

The CottonConnect training programme has introduced farmers to a range of simple changes to practices that allowed them to improve yields and reduce their water use by 30% in 2012-13.

Furrow irrigation: The farmers used to flood their fields with water, but a shift to alternate furrow irrigation has proved very successful in saving water;

Green mulching: Farmers are taught how to keep moisture levels in tact by using green mulching, enabling the land to retain moisture for a longer period of time;

Plastic mulching: This mulching works in the same way, reducing the amount of water needed to keep the moisture levels high;

Soil conservation: Again, this activity has the added benefit of containing moisture in the soil and requiring less water in the process.



Hardeep Desai, Farm Innovation Director at CottonConnect, South Asia

"Our priority is to get farmers engaged, show them how to conserve water and then support them with a structured programme.



"It's important for farmers to understand the problem. So when we visit the village while conducting the farmers training, we give the farmers small examples which are easy to understand. During the discussion, we request an elder farmer to explain about the scenario of underground water table in the village when he was a teenager. The farmer will explain that water was available only five to ten feet down when he was a teenager. Today, the underground water table is 700 feet down.

"We then ask him to think about his children, and the situation when his children are older. The farmers will say that it is not easy to predict situation of underground water table after 20-30 years. This will act as a thought provoking exercise. It really helps farmers focus on the future of water and decide to act now. We also ask them to adopt practices of alternate furrow irrigation, Micro Irrigation System and other soil and moisture conservation activities.

"These simple water management ideas are usually new news to farmers. Good water management practices give these farmers the scope to grow the crop with judicious use of water — which ultimately helps in increasing the underground water table and give good results."

2.3 Investing in Modern Agricultural Practices

Beyond adopting simple and low-cost improvements, farmers can experience significant benefit from the introduction of technologies, such as drip irrigation, which can reduce water consumption by up to 60% for some farmers.

Of course, new technologies demand financial investment and the inability of the majority of farmers to access adequate finance, is one of the

significant factors hindering the adoption of modern agricultural practices in cotton cultivation.

But it is the one thing that could have the most dramatic and significant impact in cotton farming. Less than 2% of the total irrigated area in India is currently drip-irrigated.

The WWF report states that 50-80% of the water withdrawn actually reaches the crops because it is often lost during the transfer to the field.

THE DRIP POOL PROGRAMME IN INDIA



Before and after: Deshal Banesang Mori has reaped the benefits after buying a 3.5-acre drip irrigation system using a loan from the Drip Pool Programme.

he Drip Pool Programme, funded by the C&A Foundation, began in June 2011. The project's aim was to improve the productivity of the cotton crop for farmers in India by cutting the water footprint through the use of irrigation.

CottonConnect, working with local partner Aga Khan Rural Support Programme India (AKRSPI), helped mobilise the cotton-growing farmers by educating them on the uses and benefits of microirrigation systems – particularly drips that reduce water consumption and improve the productivity of the cotton crop.

Deshal Banesang Mori is from Sidsar village of Sayla Taluka in Gujarat, a state on the west coast of India with a population of more than 60 million. He has a 5.5 acre farm used to cultivate cotton (using 3.5 acres), vegetable cluster beans and wheat.

In 2011, Deshal purchased a 3.5-acre drip irrigation system using a financial loan from the Drip Pool Programme. After installing the system, he was able grow cotton three weeks ahead of the usual planting season and has harvested 2,700 kilograms more than his brother Vajesang who is farming the same size and quality of land with the same agricultural inputs.

Meanwhile, Magan Bhai a farmer in Sanosara village in Chotila Taluka, again in Gujarat, India also installed drip irrigation system as part of the Drip Pool Programme.

In 2012-2013, India faced a poor monsoon season. However, Magan found his cotton production increased by 50% compared to the previous year. Last year, his income was INR190,000 (\$3,147). But this year, that figure rose to INR285,000 (\$4,720), and being able to plant a crop of beans gave Magan an additional income of INR120,000 (\$1,978).

He also experienced cost savings using less phosphorus fertiliser and saved INR32,100 (\$529). And he reduced the number of labour days spent weeding and irrigation by 25% to 30%.

Drip irrigation not only results in significant water saving, but also results in an increase of the yield with higher germination rates. Introduction of the drip means farmers don't need to rely on the rainfall – and the early maturity of the crop gives a better return on the investment. The fertilizer-use efficiency also increases with a provision of application of fertilizers through drip irrigation.

2.4 Research shows water benefits in organic cotton vs. conventional approach

In 2011, C&A Foundation and CottonConnect supported the Water Footprint Network to review the environmental impact of organic cotton farming practices versus conventional practices. The study was designed to better understand the impact of cotton farming on freshwater pollution using grey water footprint (GWF) – the volume of water required to maintain the water quality according to agreed water quality standards - as an indicator.

It studied two farm samples, one composed of 240 conventional cotton farms and one composed of 240 organic cotton farms in the states of Gujarat and Madhya Pradesh in India where around 40% of the cotton fibre used in C&A's clothing is cultivated.

It confirmed that conventional farming practices generally have a higher grey water footprint than organic farming practices. Yes, the conventional farms are able to produce 635 metric tonnes of cotton a year (versus the 577 tonnes of organic production), but "it does not justify the 5.5 times larger total grey water footprint (951.583 m3/year for the conventional farms and 30.703.437 m3/year for the organic farms)," says the report.

"Organic farming practices showed smaller grey water footprint and therefore a lower impact on water resources, while having similar land productivities as in conventional farming," it added. "An important reduction of the grey water footprint and therefore a more sustainable supply chain could be achieved by organizing farmer training, especially for those shown to be the main contributors to the overall water footprint."

The CottonConnect farmer training programme makes farmers aware of the volumes of pesticides and water they are using, how this relates to the crop yield and how to use more sustainable cotton farming practices.

You can read the full details of the methodology and analysis of the study here:

www.waterfootprint.org

C&A Foundation Pioneering Farmer Training

C&A Foundation is a founding supporter and partner for CottonConnect's work with more than 130,000 farmers in India, Pakistan and China.

"With CottonConnect, C&A Foundation is piloting financing schemes to give farmers greater access to drip irrigation technology. These new irrigation systems can increase yields by 30% and reduce water usage by up to 60%," comments Leslie Johnston, Executive Director C&A Foundation.

"We believe raising awareness of the benefits of organic cotton is important. It is the great standard to which we all should strive – given its proven environmental, social, and economic benefits. We already see how our support to this sector is contributing to improved livelihoods and healthier farming communities. And we aim to deepen this work, ultimately impacting hundreds of thousands of people who depend on cotton for their livelihoods.

"C&A Foundation is proud to support CottonConnect in its work connecting retailers to cotton farmers, helping both to work closely together to create a sustainable cotton industry and better business for the future. There are many examples of the positive impact for the cotton industry and by sharing these stories, we hope more brands will be inspired to act."

3. Action from brands to take impacts to scale



he activities and approaches for smallholder cotton farmers, supported by CottonConnect, prove that change is possible. In fact, results demonstrate that basic interventions at farm level can make a significant difference, environmentally, socially and economically, as smallholders reap the benefits of using less water while improving their crop yields.

But now is the time to scale-up these activities so that these pockets of action at a project or pilot level are replicated and reinforced by not only hundreds of thousands of farmers, but by millions. However, challenges and barriers to the adoption of more modern and sustainable agricultural practices remain.

These could potentially be overcome by international brands playing a bigger role in helping to build better relationships with their suppliers and to support the efforts of farmers that will build a more resilient supply of cotton via knowledge-sharing, education, training and improving access to finance.

3.1 Brands and Retailers Must Recognise the Business Risk and Be More Accountable

The CDP's 2013 Global Water Report suggests that companies are getting to grips with their water use, risk and impacts. The survey indicates that over 90% of the businesses that responded now have water management plans in place.

But despite the vast majority of companies reporting that water represents a "substantive business risk", most companies are primarily focused on managing water within their own operations – not along the supply chain. The CDP claims that "water stewardship activities are notably lacking, potentially exposing their company and investors to risks that could be mitigated".

The recent VOX Global/Pacific Institute study examining whether US companies are prepared for looming water challenges is consistent with the CDP data. Responding to the survey, 79% percent of businesses claim that they currently face water challenges, with 84% stating that they will face water challenges in the next five years.

And many make the connection between water challenges and their bottom line, with almost 60% indicating that water issues are likely to negatively affect business growth and profitability.

However, many respondents said they had no plans to increase the breadth and scale of their water risk management practices. The report claims that "nearly 70% of companies said their current level of investment in water management is sufficient", which is inconsistent with the widespread belief that water challenges "will significantly worsen in the next five years".

Clearly, business recognises that water issues are important and pose a significant risk to their



business. But the reality is that few are making plans to do something about it, particularly in dealing with the water challenges faced across their supply chain.

If you are unaware of the impacts along the supply chain – or don't know where they are – it is difficult to be accountable for dealing with them. It is up to brands to understand the challenges faced by their suppliers and to take action where it is needed.

BRINGING JOHN LEWIS FACE TO FACE WITH ITS COTTON FARMERS

he UK retailer John Lewis has been working with CottonConnect to improve its relationship with its suppliers and increase traceability. In February, Stephen Cawley, the company's Head of Sustainability and Responsible Sourcing paid a visit to some of the local smallholder farmers in India that are involved in a joint three-year farmer training programme.

Cotton is the main raw material for John Lewis' textile and apparel teams, and securing a sustainable and transparent supply in the future is vital. The programme sees the UK retailer work with local farmers responsible for producing cotton used in the manufacturing of its towels, bath mats and curtains, sold in stores throughout the UK.

The programme helps to educate and train India's conventional cotton farmers to move to more sustainable farming methods, with CottonConnect working with manufacturers, spinners, and farm groups to make changes at a farm level.

A total of 1,500 farmers will be trained during the three-year period of the project, positively affecting the lives, livelihoods and employment of around 7,500 people.

But this is also an opportunity for John Lewis to ensure security of supply, improve traceability to the source of the cotton fibre used in its products, and interact with the farmers at the end of the supply chain.

Traditionally, the John Lewis buying teams operate through brokers in the cotton industry. But here, the cotton-buying team is brought face-to-face with farmers.





John Lewis team welcomed

"It was amazing to see the interaction between the retailer team and the local farmers," explains Alison Ward, CottonConnect's CEO. "The moment when the villagers met their customers responsible for turning the raw material into actual products was incredible. But when a commercial entity turns up in a village, the whole dynamic can change."

"We act as an independent third party, helping to build a new trade model; keeping it separate from the commercial conversation, helping to provide the right conditions to facilitate better understanding, greater transparency, working towards better livelihoods for the farmers."

So, what's driving this traceability and relationship-building between brand and farmer? There's no doubt that ethically-conscious and increasingly demanding consumers expect more from the companies they buy from, right across the high street.

"John Lewis is an established and trusted brand, so it was natural for us to want to ensure transparency and integrity right across our supply chain and support the development of close relationships with our suppliers," said Stephen Cawley, Head of Sustainability and Responsible Sourcing John Lewis.

"The engagement brings benefits to the brand – we are helping to ensure security of supply, traceability to the fibre source, as well as having a positive impact on the social and environmental conditions of the farmers in India – which is crucial when such a large part of our manufacturing supply chain is based in that part of the world."

John Lewis team in India

3.2 Improve Traceability

Consumers are increasingly aware of the sustainability credentials of the brands from which they purchase products and services.

A 2013 study by GlobeScan, SustainAbility and BBMG found that a majority of consumers are seeking to reconcile their desire for shopping and style with responsibility to the environment and society through their purchases. According to the report, 'Rethinking Consumption: Consumers and the Future of Sustainability', almost two-thirds of consumers globally say they "feel a sense of responsibility to society". And two-thirds of consumers say they "have a responsibility to purchase products that are good for the environment and society".

And consumers say that they will pay more for those goods. A recent study by Nielsen found that 55% of global online consumers across 60 countries say they are willing to pay more for products and

services provided by companies that are committed to positive social and environmental impact.

As household names, brands command huge brand loyalty and are ideally placed to raise consumer awareness of and demand for greener products by improving traceability and creating more effective communications strategies to explain their approaches to sustainability.

The cotton industry needs greater collaboration between retailers and farmers to address major challenges and create a more sustainable industry.

CottonConnect connects retailers with their cotton supply chain through bespoke programmes and technology and by providing strategic advice on supply chains for the future. This includes value chain mapping, analysing transactions from garment to farmer, connecting supply chains from farm to garment and the monitoring and evaluation of impacts.

3.3 Help Improve Access to Finance

Many farmers need capital, usually in the form of loans, to be able to buy modern equipment, such as drip irrigation technology.

CottonConnect, in association with C&A, International Finance Corporate (IFC) and IDH – the Sustainable Trade Initiative, launched the India Drip Finance Programme, in a bid to promote innovative and implementable solutions that solve the problem of accessing finance for drip irrigation in cotton cultivation in India.

The pilot learning programme was designed to provide loans for the farmers to pay for drip irrigation apparatus. The loan was to be repaid by the farmer and the money returned to the programme. The learning programme found that while national level banks see the need to invest in farmers 'at the bottom of the pyramid' locally based banks are often too nervous to extend credit. Also from farmer perspective they needed to have the reassurance of support of medium term support (3 to 5 years), as they are often concerned about adopting new practices.

Finding ways for farmers to access credit and empowering them – not just with information and knowledge, but with business skills too – is absolutely crucial.

There could be multiple steps to this including:

- Involvement of NGOs. Farmers trust the NGOs as they are local and the intermediary coordination remains at its best;
- Government contribution to the reduce the intermediary process cost requirements that add up to the cost of the whole product; and
- Collaboration between external agencies, as well as cotton fibre consumers, in funding the drip irrigation equipment as a loan managed with the sale of the fibres at the time of harvesting.

An inclusive approach is required to embrace and train the poorest farmers, not just the already mobilised or educated farmers.

3.4 Collaboration and Investment from Brands in Farmer Training is Critical

Effectively scaling-up the activities and approaches outlined in this report will only be achieved through collaborative effort; the challenge is too big for any single organization to do it alone.

The opportunity for collaboration to tackle cotton's big challenges is significant. International development agencies, governments, businesses and NGOs must find ways to work together – to help find solutions to address the challenges and agree a vision for what a sustainable cotton industry looks like – and map the route to get there.

By partnering with agencies of government, investors and funders, the efforts of smallholder farmers can be linked to wider watershed activities, thereby benefiting from and contributing to water management at a watershed level.

Those invested in the cotton industry need to address the water challenge and learn how to support small holder farmers to produce cotton with less water. It is up to business to play a leading role and for the likes of CottonConnect to facilitate this collaboration.

4. Time for Action

This report from CottonConnect outlines a number of activities and approaches working with smallholder farmers that are already successfully enabling a more sustainable cotton supply chain, as well as a number of recommendations for brands and retailers.

But what can businesses do to help tackle the water issues that post a serious risk to growth and profitability in the coming years?

This is a call to action for brands and retailers to step forward:

- Understand and recognise the risk associated with water scarcity and security of supply. As water tables fall and pressure on farmers rises, it is time to get serious about the threat posed by this huge challenge to the cotton industry.
- Map suppliers and develop better transparency and security of supply. Learn from brands working with a fully transparent supply chain, understanding the pressure points for suppliers, and working to eliminate the risk associated with cotton supply.

- 3. Take action to support smallholder farmer training programmes providing basic interventions. Educating and training farmers to adopt more sustainable agricultural practices is proven to reduced their water consumption by up to 30%. Helping them to access finance to invest in technologies, such as drip irrigation, can lead to water reduction of up to 60%.
- 4. Collaborate with others to help drive this supply chain sustainability at scale. Work with international development agencies, governments, NGOs and other businesses to develop innovative ways to transform the entire cotton supply chain at scale.
- 5. Share information best practice and learnings with your teams, with your colleagues across the industry, and with members of your supply chain, to facilitate support and investment to help secure a sustainable future for the cotton industry.



Farmers in farmer training workshop on more sustainable farming practices, India

CottonConnect is a social enterprise pioneering a transparent and sustainable cotton supply chain from retailers to farmers to build a sustainable future for the cotton industry.

- Connecting retailers to the supply chain and to cotton farmers, creating relationships, transparency and efficiency, delivering business value, reducing costs and building security of supply.
- Improving farmer livelihoods we help farmers farm better by supporting them with business skills, access to finance, knowledge and expertise in farming practices – which are better for the farmer and for the environment.
- Sharing best practice farmer education, farmers groups to share knowledge, and support knowledge of farming techniques, helping them to farm safely and sustainably.

In the last four years, we have worked with 130,000 farmers and increased the land under sustainable cultivation by almost 300,000 acres. On average, we have helped to reduce the water usage of the farmers we have worked with by 20% (but in many cases as much as 30% to 60%).

Get in touch to find out more about CottonConnect's services – www.cottonconnect.org

