EXPLORING THE ENVIRONMENTAL IMPACT OF COTTON PRODUCTION AND THE ROLE OF ETHICAL FINANCE

Sodikhojayeva Yokutkhon Odil qizi
Line manager of `MMF` International Scientific Journal, Independent researcher,
Management Development Institute in Tashkent
https://doi.org/10.5281/zenodo.11442728

Abstract. *First and foremost, I`d like to convey my heartfelt thanks to my father for supporting me in crucial moments of my life and making me take a deeper look at life. And my honorary staff who has always been active, friendly, incredibly supportive and helping hand to every student in our Institute (MDIST) (Lola Eshmirzayeva, Laura Kadirkulova) and several others. I am so grateful for the incredible support throughout my difficult moments. This article exposes the hidden water costs of conventional cotton farming and its negative impacts on water resources and ecosystems the piece puts attention on the unsustainable techniques underlying a single cotton T-shirt and highlights the hard reality of water shortage, which is compounded by fashion. Traditional cotton production, the backbone of the global fashion industry, carries a significant environmental burden - a staggering water footprint. This article examines the unsustainable practices that lead to water scarcity and explores the potential of ethical finance in promoting a more sustainable and responsible textile industry. The study reveals the alarming impact of traditional cotton farming on water resources and ecosystems, emphasizing the urgent need to adopt more sustainable practices. Depletion of water resources, degradation of ecosystems, and displacement of local populations are all consequences of this unsustainable model. The article then examines the role of ethical finance in addressing these challenges. Green banking and Islamic finance, with their emphasis on ethical investment and environmental sustainability, appear to be promising solutions. By adopting these financial models and working together, stakeholders can pave the way for a future in which fashion flourishes without compromising the planet's precious water resources. The article emphasizes the potential for collaborative action and the transformative power of ethical finance in creating a more sustainable and equitable textile industry.*

Keywords*: Cotton Production, Water Scarcity, Environmental Impact, Sustainable Agriculture Green Banking, Islamic Finance, Ethical Fashion*

Introduction. The fashion industry, a global juggernaut driven by trends and consumerism, is at a tipping point. Our seemingly insatiable appetite for clothing, especially cotton, is having a profound and detrimental impact on our planet's most precious resource: water. It takes 2,700 liters of water to produce a single cotton T-shirt - a volume equivalent to the average person's drinking water consumption over three years. This harsh reality highlights the hidden environmental costs of traditional cotton cultivation, especially in regions suffering from water scarcity. The consequences of this unsustainable practice are far-reaching. Depletion of water resources, ecosystem degradation, and displacement of local populations are just some of the negative impacts we face. In addition, the fashion industry's dependence on traditional cotton exacerbates water scarcity in many parts of the world, especially in regions already facing water scarcity. This unsustainable cycle threatens the livelihoods of millions of people and hinders economic development, especially in agricultural areas. Recognizing the seriousness of the problem, this paper

seeks to draw attention to the unsustainable practices inherent in traditional cotton cultivation, highlighting their negative impacts on water resources and ecosystems. Furthermore, the paper explores the critical role of ethical finance, particularly green banking and Islamic finance, in promoting a more sustainable and responsible textile sector. These groundbreaking financial methods point the way to a future in which fashion may thrive without risking the essential resources that sustain us.

Water Scarcity and the Urgent Need for Sustainable Practices

The essay discusses the grave situation of water scarcity, which is aggravated by traditional cotton producing practices. We provide a persuasive argument for the transition to sustainable alternatives, emphasizing the importance of green banking and Islamic financing in facilitating this shift to a more ecologically conscious textile sector.

Fashion Industry's Water Pollution

The fashion industry's dyeing and finishing processes contribute to 20% of global industrial water pollution, releasing a toxic mix of chemicals and dyes. Textile production is responsible for approximately one-fifth of the world's clean water pollution. A single t-shirt can require up to 2,700 liters of water throughout its lifecycle, much of which becomes contaminated during dyeing and finishing. Microplastics from synthetic fabrics add to the pollution crisis, with a single clothes wash releasing up to 700,000 microplastic fibers into waterways. These alarming figures highlight the urgent need for sustainable practices and ethical financing to cleanse the fashion industry's polluted waters.

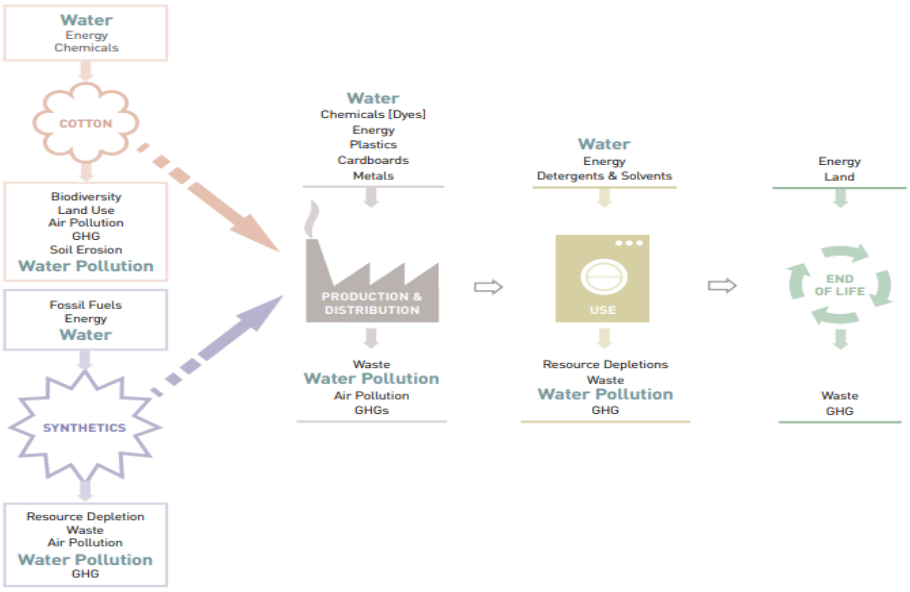


FIGURE 2: *Water Impacts & Dependencies - Textile Supply Chain*

Wastewater Discharge: Textile factories often release untreated or inadequately treated wastewater into rivers and streams. This wastewater contains a mix of chemicals, dyes, and organic matter, which can deplete oxygen levels, disrupt aquatic ecosystems, and contaminate drinking water sources. The consequences of fashion industry's water pollution are far-reaching, impacting not only environmental health but also human well-being. Communities living downstream from textile factories often face health risks due to contaminated water sources, and the economic burden of water pollution further exacerbates social inequalities.

Unique Insights and Research Findings:

Drawing upon credible sources such as the World Wildlife Fund, the Water Footprint Network, and academic research papers, we quantify the water footprint of cotton production and its impact on water resources in various regions. We delve into case studies of areas facing water stress due to unsustainable cotton cultivation and explore successful examples of sustainable cotton initiatives that prioritize water conservation and environmental protection.

highlighting specific practices, challenges, and lessons learned.

The World Bank: They have extensive reports on water scarcity and its impact on developing countries, particularly in cotton-producing regions. (https://www.worldbank.org/)

The United Nations Convention to Combat Desertification (UNCCD): This organization focuses on sustainable land management and water resources, with relevant reports and publications on the environmental impact of cotton production. (https://www.unccd.int/) The International Cotton Advisory Committee (ICAC): (https://www.icac.org/)

The Cotton Campaign: This organization advocates for ethical cotton production and has valuable resources on the social and environmental impacts of the cotton industry. (https://www.cottoncampaign.org/)

Rainforest Alliance: They have a certification program for sustainable cotton, providing insights into the criteria and practices used to promote environmentally responsible cotton production. (https://www.rainforest-alliance.org/)

The Soil Association: They offer a certification program for organic cotton, highlighting practices that minimize environmental impact and promote soil health. (https://www.soilassociation.org/)

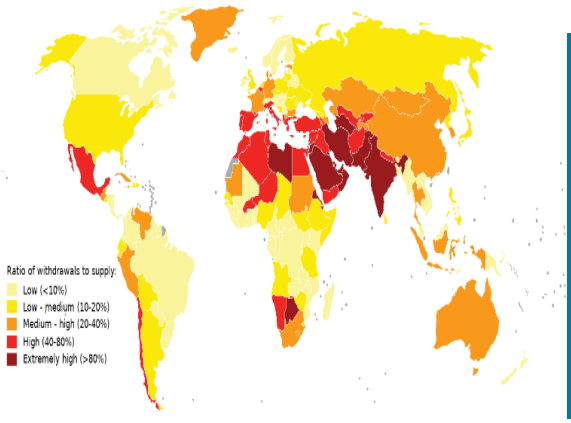
Target Audience: Policymakers, investors, consumers.

Overview of Cotton's Thirsty Footprint:

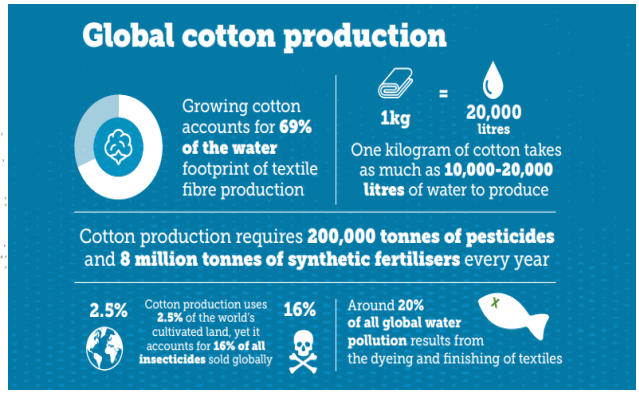
Cotton is a notoriously water-intensive crop, demanding significant amounts of water throughout its growth cycle, from seed germination to boll maturation. On average, cotton needs about 50-200 inches of water during a growing season. The actual amount depends on climate, weather conditions, and irrigation method, but any ways cotton will always need significantly more water than most other crops. The Water Footprint Network estimates that producing just one kilogram of cotton requires an average of 10,000 liters of water. This excessive water consumption puts immense pressure on water resources, particularly in arid and semi-arid regions where cotton is often cultivated.

Depleting Water Resources:

The insatiable thirst of cotton plants has led to the depletion of aquifers, the drying up of rivers and lakes, and the lowering of water tables in many cotton-growing regions. The Aral Sea disaster serves as a stark example of the devastating consequences of unsustainable water management in cotton production. Once the fourth-largest lake in the world, the Aral Sea has shrunk to a fraction of its original size due to excessive water withdrawals for irrigation, primarily for cotton cultivation. This environmental catastrophe has had severe repercussions on local communities, ecosystems, and the regional climate.



Map of global water stress



Global Cotton Production and Water Stress

Global Rethinking of Cotton Production

The environmental consequences of cotton production have not gone unnoticed on the international stage. Several countries, recognizing the detrimental impact of conventional cotton farming on water resources and ecosystems, are actively seeking to reduce their reliance on cotton production or transition towards more sustainable alternatives. For instance, Countries like Israel and Australia have invested heavily in research and development of drought-resistant cotton varieties and precision irrigation technologies to minimize water usage in cotton cultivation.

Water Pollution and Ecosystem Degradation:

Beyond its excessive water consumption, conventional cotton farming relies heavily on agrochemicals, including pesticides, fertilizers, and defoliants. These chemicals leach into waterways, contaminating surface and groundwater resources, and pose significant threats to aquatic life and ecosystems. Pesticides can kill fish, amphibians, and other aquatic organisms, disrupting the delicate balance of aquatic ecosystems. Furthermore, fertilizer runoff can lead to eutrophication, a process where excessive nutrients cause algal blooms, depleting oxygen levels and creating dead zones in water bodies.

Conventional cotton farming practices also contribute to soil erosion and land degradation. Intensive tillage, monoculture cropping, and the removal of crop residues leave the soil exposed and vulnerable to erosion by wind and water. This loss of topsoil reduces soil fertility, diminishes agricultural productivity, and contributes to desertification in some regions.

Social and Economic Implications:

The environmental consequences of cotton production have far-reaching social and economic implications. Water scarcity and pollution affect the livelihoods of farmers, disrupt local economies, and contribute to conflicts over water resources. Communities living near cotton-growing regions face health risks due to exposure to pesticides and contaminated water. Moreover, the degradation of land and water resources undermines long-term agricultural sustainability and food security.

Green Banking and Islamic Finance: Catalysts for Sustainable Transformation

Green banking and Islamic finance offer promising pathways towards a more sustainable and ethical textile industry. Green banks prioritize investments in environmentally friendly projects, including sustainable cotton initiatives, water conservation technologies, and renewable energy solutions. They provide financial products and services that incentivize businesses and individuals to adopt sustainable practices.

Islamic Finance and Environmental Stewardship:

Islamic finance, guided by the principles of Sharia law, emphasizes ethical and responsible financial practices. Sharia principles prohibit activities that harm the environment or society, making Islamic finance naturally aligned with environmental sustainability. Islamic financial institutions invest in projects that promote environmental stewardship, resource conservation, and social well-being. They offer financing solutions that support sustainable cotton production, such as Murabaha (cost-plus financing) and Ijara (leasing) arrangements for organic cotton farms and eco-friendly textile manufacturing facilities.

Examples of Sustainable Cotton Initiatives

Several organizations and initiatives are actively promoting sustainable cotton production practices. The Better Cotton Initiative (BCI) works with farmers worldwide to adopt more sustainable practices, including reducing water usage, minimizing pesticide and fertilizer application, and improving soil health. The Organic Cotton Accelerator (OCA) supports organic cotton farmers and promotes the adoption of organic farming methods, which eliminate the use of synthetic pesticides and fertilizers, thereby protecting water resources and soil health.

Conclusion: The fashion industry's reliance on conventional cotton farming practices presents a stark reality – our desire to be clothed comes at a significant environmental cost, particularly in terms of water consumption. The staggering water footprint of a single cotton t-shirt is a stark reminder of the unsustainable path we are currently on. We cannot afford to deplete our precious water resources and jeopardize ecosystems for the sake of fast fashion. There is, however, a glimmer of hope on the horizon. Green banking and Islamic finance principles, with their emphasis on ethical and sustainable practices, offer a potential solution. By providing financial support and guidance to textile businesses transitioning towards organic cotton farming, water-efficient technologies, and closed-loop production systems, these financial models can pave the way for a more responsible and environmentally conscious fashion industry. The journey towards sustainability requires a collective effort. Consumers need to become more aware of the environmental impact of their clothing choices and embrace sustainable brands. Policymakers need to incentivize sustainable practices and regulate harmful ones. And the fashion industry needs to embrace innovation and collaboration to find eco-friendly alternatives and production methods. By weaving together, the threads of awareness, responsible financing, and innovative solutions, we can create a future where fashion thrives without compromising the health of our planet and its resources. This shift is not just an option, but a necessity, to ensure a world where both our wardrobes and our ecosystems can flourish.

REFERENCES

1. True Costs of Cotton: https://ejfoundation.org/resources/downloads/EJF_Aral_report_cotton_net_ok.pdf
2. Effect of Water Stress on the Growth and Yield of Cotton Crop (Gossypium hirsutum L.) https://www.scirp.org/journal/paperinformation?paperid=55999
3. Better Cotton Initiative: (BCI): https://bettercotton.org/
4. Organic Cotton Accelerator: (OCA): https://organiccottonaccelerator.org/
5. Food and Agriculture Organization of the United Nations (FAO): http://www.fao.org/home/en/
6. International Water Management Institute (IWMI): https://www.iwmi.cgiar.org/
7. The Aral Sea Crisis: https://www.unep.org/explore-topics/water/what-we-do/addressing-water-scarcity/aral-sea-basin

8. Green Banking and Sustainability: https://www.unenvironment.org/explore-topics/green-economy/what-we-do/finance-and-economic-instruments/green-banking
9. Islamic Finance and Environmental Sustainability: https://www.islamicfinance.com/
10. Sustainable Apparel Coalition (SAC): https://apparelcoalition.org/
11. World Wildlife Fund (WWF): https://www.worldwildlife.org/industries/cotton
12. Global Cotton Production and Water Stress
13. Water Footprint Network: https://waterfootprint.org/en/
14. Global cotton production under climate change – Implications for yield and water consumption: https://hess.copernicus.org/articles/25/2027/2021/