YFCA جمعية رعاية الأسرة
RESEACH UNIT

Cotton Value Chain Analysis Report

Abyan and Lahj Governorates, Yemen

June 2024

YFCA جمعية رعاية الأسرة

Contents

Abbreviation

FGDs	Focus Group Discussions
FSL	food security and livelihood
KIIs	Key Informant Interviews
MFIs	microfinance institutions
MAI	Ministry of Agriculture and Irrigation
YFCA	Yemen Family Care Association

Introduction

Yemen, known for its cultivation of both medium-staple and long-staple cotton, has a historical background in cotton production that dates to 1946. Cotton, often referred to as "white gold" in traditional Yemeni songs, holds deep cultural significance in Yemen. The southern and eastern regions saw the initial introduction of cotton cultivation during British occupation. In the north, Hodeida and the coastal areas of Hajja Governorates are the only areas that cultivate medium-staple cotton.

The total cotton cultivation area in Yemen in 2021 reached 5,226 hectares, yielding an estimated 5,252 tons of cotton. Hodeida accounted for 1,760 hectares of cultivation, resulting in productivity of 2,000 tons, while Lahj cultivated 985 hectares, yielding 987 tons. Abyan had an estimated farm area of 2,352 hectares, with a productivity of 2,129 tons, and Hajjah accounted for 92 hectares, with a productivity of 96 tons[1].

The paper highlights that cotton varieties are predominantly grown in Ahwar Delta and Abyan Delta of Abyan Governorate, with the currently cultivated variety being the long-staple Maalim 2000. In Lahj Governorate, Tuban Delta, and Tihama Plain of Hodeida Governorate, the Akala SG2 variety is primarily grown. Cotton cultivation thrives in clay lands that are yellow, loamy, free from salts, and devoid of weeds[2].

Though this high importance, farmers indicate that there is a shift towards cultivating qat and other cash crops that provide quick income, coupled with the neglect and lack of support from the government towards cotton farmers, which has led to the deterioration and possible extinction of cotton production[3].

[1] Al Maqtari, Moahmmed Ali, research paper, AlThawrah newspaper discussed in a workshop on the cotton value chain issue: published date 31 May, 2023.
[2] Ibid
[3] Interview with the Director of the Agriculture Office of Lahij Abdulmalek Nagy published in Aden AlGhad newspaper Sunday- 17 February 2019.

History of Cotton in Yemen

During the British colony, cotton cultivation witnessed great prosperity. A cotton variety called (long-staple) of hybrid Sudanese-Egyptian origin was introduced (called Code 4). Two prominent cotton gins were introduced to Abyan in 1952 and Lahj in 1956. In Lahj, the cotton gin was established in the Sabr area, located between Aden and Al-Hawtah, the centre of Lahj Governorate, with 32 ginning machines, presses, and accessories, with a production capacity of 2,656 pounds per hour. The living conditions of farms improved, and the state treasury enjoyed a good share and a noticeable improvement in economic aspects. The British government in Aden encouraged cotton cultivation in Lahj and Abyan at the request of English companies.

In 1954, the Agricultural Recovery Commission was established in Lahj, which was credited with cultivating cotton and pursuing its stages until harvest, providing seeds and white loans to farmers to encourage the cultivation of cotton products. The local authorities were crucial in promoting and supporting farmers in growing this valuable crop. Factors such as the availability of water resources, government assistance through loans and inspections, and pest control efforts contributed to the successful cultivation of cotton in Lahj.

The highest rate of cotton production was in the year 1967, when the Delta's cotton production reached 36 million pounds, while production quantities ranged between 20-30 million pounds for an extended period before the amounts of cotton produced diminished and decreased to 3-6 million pounds in the past few years for various reasons; 3 million pounds in the 2000-2001 season, and 6 million pounds in the 2005-2006 season[4].

The oldest traces of linen (cotton), it was found in the ruins of the Shibam al-Gharas cemetery, when mummified bodies were found wrapped in well-made linen wrappings and flakes of skin. The analysis revealed that their history dates back to the third century BC, which confirms that the ancient Yemenis knew not only cotton cultivation but also the textile industry. At the beginning of Islam, Yemen was famous for its textile and knitting industry, and it exported various types of fabrics to all parts of the Arabian Peninsula.

The policies that followed the independence of Southern Yemen related to land nationalization and centralization contributed to the deterioration of cotton cultivation. After the country's reunification in 1990, there was a shift towards new agricultural concepts, particularly the liberation of agriculture from state interference, programs, and marketing regulations. This resulted in all crops, including cotton, being subjected to market policies dictated by supply and demand dynamics, to which cotton farmers found themselves in a weak position, which led them to look for more corps with shorter cycles[5].

[4] https://www.aden-tm.net/news/23133

[5] Ibid

Historical milestones in cotton cultivation in Lahj:

Lahj and Abyan governorates have a long-standing connection to cotton cultivation, which has been a distinguishing feature of their agricultural landscapes along the various valleys. Over the years, cotton cultivation in Lahj has undergone distinct phases, influenced by factors such as seasonal floods and socio-political dynamics.

- **Early fifties:** The British colony authorities introduced cotton cultivation in Lahj Delta in 1954 after the successful cultivation in Abyan. Committees and administrative bodies were established to support and expand cotton cultivation, and a gin was established in Saber area.
- **Mid-Fifties to Independence:** The period was marked by a significant surge in cotton cultivation. Undeterred by the political changes, the region saw further growth with the establishment of additional farms and infrastructure, solidifying its position as a key player in the cotton industry.
- **1978- 1983:** Tuban Delta Development Authority was established in 1978. It finances the delta development project, which included establishing a chainsaw gin and promoting the cultivation of medium—and short-staple cotton instead of long-staple cotton.
- **1983-1994:** Operation of the new saw gin in 1983 with a production capacity of 4,000 pounds per hour. However, the civil war of 1994 caused heavy losses as a result of the destruction of its plants and the burning of its stockpile of cotton, which amounted to around 260,000 USD.
- **1995:** the Ministry of Agriculture and Irrigation made a strategic decision to focus on cotton cultivation. This was accompanied by a series of reforms, including the expansion of cultivation areas and the crucial support for the rebuilding of the gin.
- **2001:** Contracting with the General Spinning and Weaving Corporation in 2001 to gin cotton produced in Tihama and the Tuban Delta.

Cotton in the World

Cotton is globally recognized as one of the most profitable non-food crops, significantly impacting economies and livelihoods worldwide. Its global significance extends far beyond its economic value, making it an essential crop that stimulates growth, supports communities, and fuels industrial sectors worldwide. It provides income to more than 250 million people, constituting approximately 7% of total employment in developing countries.

The annual global production of cotton stands at an impressive 26,172,678 tons. India holds the title of the world's largest cotton producer, with an annual production volume of 6,188,000 tons, followed closely by China in second place with an annual production of 6,117,318 tons. Egypt ranks eighteenth with an annual production of 113,000 tons, while Sudan secures the twenty-first position with an annual production of 95,000 tons. Syria ranks twenty-eighth worldwide, producing 55,800 tons annually. Yemen takes the fifty-second spot, with an annual production of 5,700 tons.

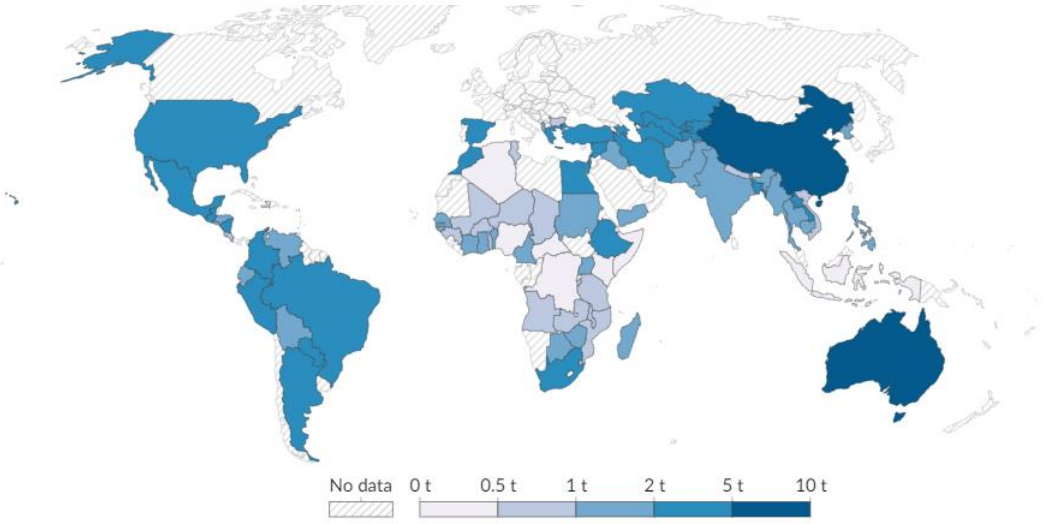


Photo 1 Cotton: Yield, 2022[6]

Cotton Usage

Cotton is extensively used in various industries, particularly the textile industry. Its fibres are renowned for their durability, softness, and flexibility, making them ideal for producing high-quality fabrics. Additionally, cotton is utilized in the manufacturing of medical cotton products, fire-resistant materials, and furniture. The fluffy material removed from the seed's surface during vegetable oil extraction serves as a valuable resource for producing affordable carpets, paper, fire-resistant materials, and furniture. The seeds themselves contain oil, with an oil content ranging from 18% to 26%, which is extracted and used as vegetable oil. Cottonseed oil also finds application in soap production. The remaining seed cake, which contains a high protein content of 32% to 36%, serves as a nutritious fodder for livestock when mixed with other feed materials. Furthermore, cotton plants are utilized as pastures, providing leaves that contribute to animal feed[7].

Medical Benefits:

Cotton possesses several properties that make it highly suitable for healthcare applications. It is renowned for its soft texture, high absorption capacity, hypoallergenic nature, and compatibility with various sterilization methods such as steam, ethylene oxide, and gamma rays. These advantages position cotton as an ideal choice for various medical uses. Absorbent cotton, also known as surgical cotton or cotton wool, finds extensive utilization in surgical dressings and

[6] https://ourworldindata.org/crop-yields
[7] Ibid

cosmetic applications and to absorb bodily fluids in hospitals, dispensaries, and nursing homes. Additionally, cotton is employed in producing traditional baby diapers and sanitary pads.

Environmental Benefits:

Cotton, being the largest natural fibre catering to global textile demand, offers significant environmental advantages. Its fibres are sustainable, renewable, and biodegradable, making cotton an eco-friendly choice throughout the entire lifecycle of textile products. In contrast, many alternatives to cotton are composed of non-renewable chemical fibres that heavily rely on petroleum and its derivatives. This reliance on non-renewable resources distinguishes cotton as an environmentally preferable alternative. Furthermore, advancements in technology have led to the development of insect-resistant and drought-resistant cotton varieties, reducing the need for pesticides and water. As a result, pollution rates and land and water waste have been curtailed. Additionally, sustainable practices such as conservative tillage have been adopted in cotton cultivation, effectively reducing erosion and soil runoff.

Assessment Objectives

This study aims to provide valuable insights into an industry that plays a crucial role in the country's economy and employment, as cotton is considered a monetary economic crop and is usually referred to as "the white gold" in Yemeni heritage. The selection of the cotton value chain for the study is driven by several reasons. Cotton holds significant industrial and strategic importance for Yemen, serving as a crucial raw material for spinning and weaving plants. Furthermore, cotton exports contribute to the national economy by generating foreign currency. The employment opportunities it creates span various population categories, ranging from crop farmers to participants in different sub-sectors. Moreover, numerous industries rely on cotton as a foundational resource.

Cotton farming, deeply rooted in the country's heritage and economy, remains a vital industry, especially in Lahj and Abyan. This report delves into the intricacies of cotton farming in these areas, shedding light on key aspects such as seed suppliers, farming practices, cost analysis, market dynamics, and challenges faced by farmers. This report aims to contribute to the sustainable growth and prosperity of this significant agricultural sector.

Amidst the historical significance and economic importance, cotton farming in Lahj and Abyan encounters both opportunities and challenges in the modern era. Technological advancements, evolving market dynamics, and the impacts of climate change necessitate a comprehensive understanding of the current landscape of cotton farming and identifying strategies to enhance productivity, profitability, and sustainability.

Through a thorough analysis of the various components of cotton farming, from seed acquisition to market distribution, this report provides valuable insights into the industry's present condition.

Additionally, through addressing the challenges farmers face and exploring potential solutions, we can pave the way for a resilient and rosperous future for cotton farming in Lahj and Abyan.

Assessment Scope

Primary data collection for this value chain analysis was conducted between 3rd Feb and 8th Feb 2024. Extensive fieldwork took place in Khanfar district, Abyan governorate, andTuban district, Lahj governorate to gather firsthand information from key stakeholders in the cotton value chain. These districts were selected due to their significance in cotton farming and their representation of the broader cotton value chain in Southern Yemen.

Methodology

This value chain analysis combined primary and secondary data. The secondary data review preceded the primary data collection, and the secondary data served as good guidance in preparing the tools and shaping the methodology. Combining primary and secondary data sources aimed to thoroughly understand the cotton value chain dynamics. The research team initially conducted a rigorous review of secondary data, including existing literature, reports, and relevant documents. This secondary data review served as a foundation, guiding the development of research tools and shaping the subsequent primary data collection process. In addition to primary and secondary data collection, various resources available on Yemeni websites and reports about Yemeni cotton history and challenges were reviewed. These resources provided contextual information and further enriched the analysis, contributing to a comprehensive understanding of the cotton value chain dynamics in the study regions.

A combination of random and purposeful sampling techniques was employed to ensure a comprehensive and representative sample. Random sampling allowed for an unbiased selection of participants, while purposeful sampling targeted key stakeholders within the cotton value chain, such as farmers, seed suppliers, wholesalers, and relevant authorities. This dual sampling approach aimed to capture diverse perspectives and experiences within the value chain.

The primary data collection phase involved in-depth interviews, focus group discussions, and consultation with the identified participants. These interactions facilitated valuable insights into the challenges, opportunities, and interdependencies across various stages of the cotton value chain. The primary data was then analyzed using rigorous qualitative and quantitative methods to derive meaningful findings and draw actionable recommendations.

In addition to groups of farmers from both districts, the following list shows the stakeholders consulted during the data collection:

Government stakeholders

- MAI office – khanfar, Abyan
- MAI office –Tuban, Lahj
- Agriculture Research Centre, Abyan
- Al Kawd Gin, Abyan

Business support stakeholders

- Input suppliers, Abyan
- Wholesale buyer, Lahj
- Retailers, Abyan
- MFIs, Aden

Tools

A set of quantitative and qualitative tools was developed internally at the Yemen Family Care Association (YFCA) research unit and food security and livelihood (FSL) program for this value chain analysis. The responsibility of tool development was assigned to a specialized agribusiness officer, who meticulously crafted the tools to ensure their relevance and effectiveness. Subsequently, the tools underwent a thorough verification process by the research unit team to validate their suitability for capturing essential insights from the diverse stakeholders involved in both the horizontal and vertical value chains of cotton in the targeted governorates.

The developed tools were designed to encompass a comprehensive range of topics and gather data from various perspectives within the cotton value chain. They were tailored to capture qualitative and quantitative information, allowing for a nuanced understanding of the value chain's challenges, opportunities, and interrelationships.

The tools included structured interview questionnaires, in-depth interview guides, and focus group discussion outlines. These instruments were specifically designed to enable effective data collection from all relevant stakeholders, including cotton farmers, seed suppliers, wholesalers, and other actors involved in the value chain.

The internal development and verification of these tools ensured their alignment with the value chain analysis's specific objectives and suitability for capturing the unique context and challenges of the cotton sector in the targeted governorates.

Assessment Team

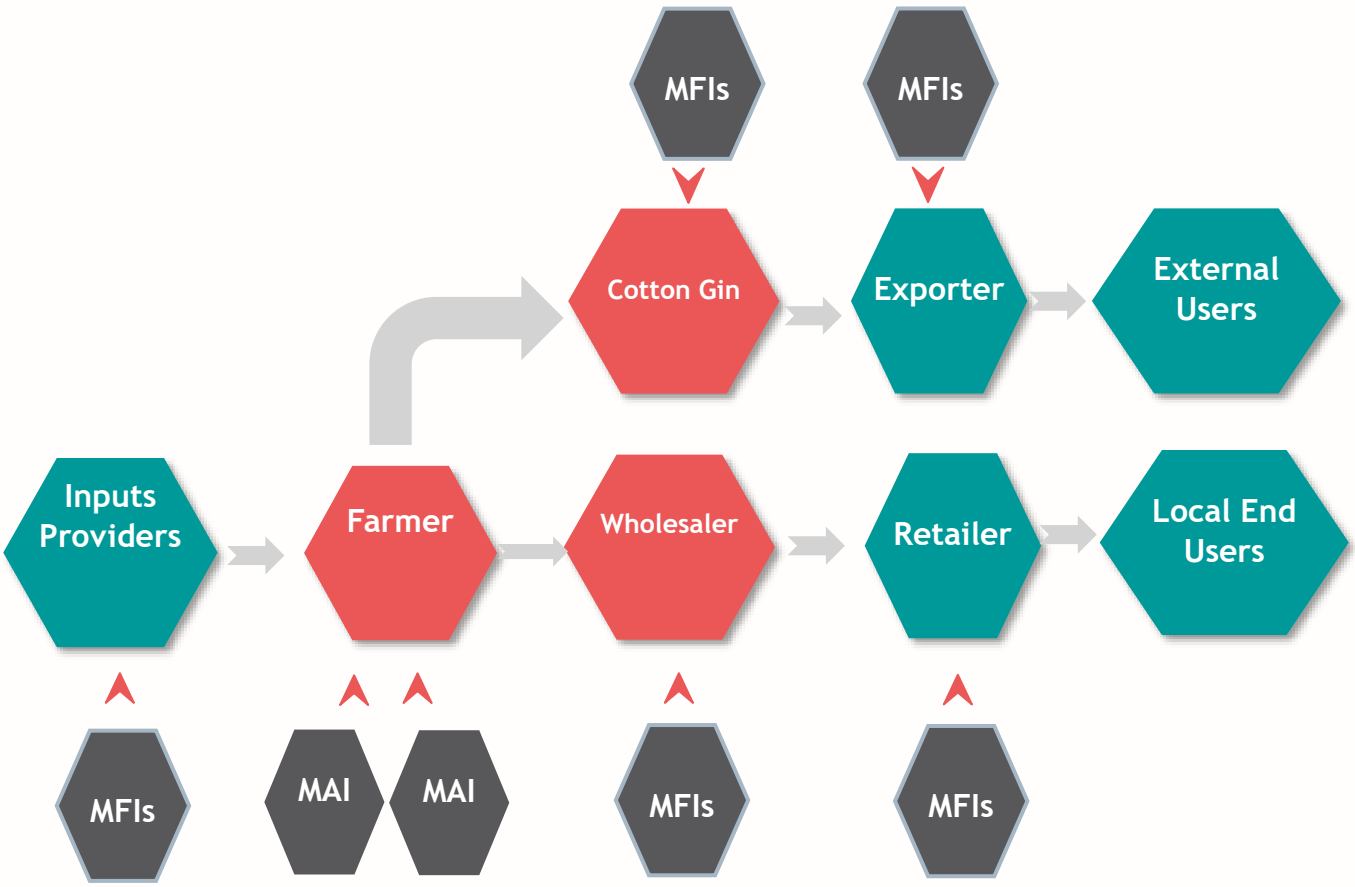
Two researchers were deployed to the targeted areas to collect data directly from the related stakeholders and farmers. YFCA office in Aden arranged the coordination, which facilitated the mission.

Challenges & Limitations

During the data collection process, we encountered several limitations and challenges. Firstly, there were time constraints, which limited our ability to gather data comprehensively within the desired timeframe. Additionally, budget limitations posed constraints on the extent of data collection activities. Moreover, conducting two studies simultaneously added complexity and required careful management of resources. Furthermore, the data collection approach was qualitative-focused, involving engagement with stakeholders rather than widely targeting a sample of farmers for quantitative analysis. Despite these challenges, the credibility of the data was assured through triangulation with various stakeholders who confirmed the accuracy of the provided numbers.

Findings

Value chain Map



The Value Chain Governors
The Horizontal Value Chain Actors
The Vertical Value Chain Actors

Seeds Supplier

Farmers take two different approaches to getting seeds in Lahj and Abyan. According to focus group discussions (FGDs) conducted in Tuban, due to the unavailability of a cotton gin in Lahj, farmers stated that they get seeds from Hodeida governorate through local wholesalers, who provide them with seeds in return for their cultivated cotton by the end of the season.

In Abyan, according to KIIs, the agricultural research authority has 80 acres of cotton land to produce seeds, and two tons are freely distributed to farmers each season.

Farmers reported that each acre requires about 10-12 KG of seeds[8]. Different approaches are employed in each district to fulfil farmers' seed requirements. In Tuban, where the unavailability of cotton gin poses a challenge, farmers depend on procuring seeds from Hodeida governorate (a sack of 40 KG costs 150.000 YER), where a similar kind of cotton grows. FGDs conducted in Lahj highlighted that farmers rely on a local wholesaler who provides them with quality seeds and establishes a unique, mutually beneficial arrangement. In return for receiving the seeds, farmers keep and deliver their cultivated cotton to the wholesaler at the end of the season. This practical solution ensures a steady supply of seeds while facilitating a reliable market for the farmers' produce.

Conversely, in Khanfar, farmers get seeds from two sources. The agriculture research authority has taken a proactive role in seed production. Based on Key Informant Interviews (KIIs), it was found that the agriculture authority owns 80 acres of cotton land dedicated to seed production. Each season, they distribute two tons of seeds free of charge to farmers, aiming to support and encourage cotton cultivation. Besides, the cotton gin distributes seeds to the farmers delivering their cultivated cotton. These approaches not only ensure accessibility to seeds but also reduce the financial burden on farmers, promoting their engagement in cotton farming.

The analysis also reveals that seeds that come out of the gin are not good enough to be directly distributed. KIIs noted that the concerned seed authority is the Seed Breeding Foundation, which has 300 acres. However, it does not function any longer and faces major operational issues.

Challenges and Potential Solutions:

To ensure a sustainable and efficient seed supply system, it is crucial to address key challenges. In Lahj, it is important to revitalize the gin not only for the sake of seed extraction but also for its high importance in the value chain in general. Delta Tuban Authority also needs to be revitalized to support cotton farmers and lead agriculture development in general.

[8] Agriculture extension disagrees with this, advising that for optimal seed rates, it is advised to use 40-50 kilograms of treated seeds per hectare, but in cases where seeds are untreated, it is recommended to increase the rates to compensate for potential crop damage caused by early turf infection. (Agricultural Extension Revival of cotton crop cultivation)

Consulted farmers look forward to getting higher-quality seeds that are more resistant to dryness and produce more quality and quantity.

As for Abyan, one significant challenge is the unsuitability of gin-extracted seeds for distribution, highlighting the need for improved seed processing techniques and quality control measures. Enhancing seed processing practices can improve seed quality and viability, leading to higher farmer productivity. Additionally, operational issues faced by the Seed Breeding Foundation must be addressed to establish it as a reliable seed supplier. Technical support, infrastructure investment, and resolving administrative bottlenecks are necessary steps. Collaborative efforts among stakeholders are essential to enhance the efficiency and effectiveness of the seed supply chain in the cotton value chain.

Exploring innovative strategies and interventions is crucial to optimising the seed supply chain and empowering cotton farmers. Potential solutions could include:

1. **Revitalizing the dormant gin in Lahj,** which halted operations due to the impact of the war and challenges related to property, premises acquisition, and obsolete machines.
2. **Strengthen the Seed Breeding Foundation in both Lahj and Abyan,** which would unleash a strategic seed supplier. This may involve providing technical expertise, investing in infrastructure, and establishing partnerships with relevant stakeholders.
3. **Enhancing the role of the Agriculture Research Authority in improving Seed Processing:** Enhancing the quality of seeds produced by the gin and employing advanced seed processing techniques and technologies to ensure that the seeds extracted from the gin meet the required standards for distribution.
4. **Facilitating Access to Financing:** Recognizing farmers' financial challenges and providing accessible and affordable financing options for seed procurement can further enhance their ability to obtain the required quantity of seeds.
5. **Promoting Local Seed Production:** Encouraging local seed production through capacity-building programs and knowledge sharing can reduce dependence on external sources and strengthen farmers' self-sufficiency in accessing quality seeds.

Input Suppliers

The input suppliers in cotton cultivation play a vital role in providing essential resources to farmers ,including fertilizers, pesticides and cultivation equipment. In our field data collection, we met a number of them and here are some key aspects related to input suppliers in the context of cotton production:

1. Payment Methods: In general, input suppliers require cash payments for the inputs provided. However, a few traders offer a postpaid arrangement, allowing farmers to pay after selling their cotton production. This flexibility in payment terms can benefit farmers facing financial constraints during the cultivation season.

2. Input Supply Contracts: Some input suppliers adopt a strategic approach through providing inputs to farmers in exchange for a commitment to get their future production. This arrangement ensures a steady cotton supply for the input suppliers and offers a sense of security for both parties involved.

3. Flexibility in Credit: Certain input suppliers demonstrate flexibility by offering credit facilities to farmers. They accept guarantees from microfinance institutions (MFIs) to secure inputs and also facilitate access to loans. This enables farmers to obtain necessary inputs even when they face financial challenges.

4. Exchange Rate Instability: One of the main threats input suppliers face is the instability of the exchange rate in the market. Fluctuations in currency values can impact the cost of imported inputs, potentially affecting the pricing and availability of essential resources for farmers.

5. Storage Challenges: Due to low demand, agricultural materials become overcrowded, causing an increased risk of damage and deterioration, which may result in lower-quality or ineffective inputs reaching the farmers.

6. Relationship with Farmers: Many input suppliers maintain a good relationship with farmers. This includes providing guidance on input selection, offering technical advice, and addressing any concerns or issues farmers raise. A strong relationship between input suppliers and farmers fosters trust and collaboration, contributing to the success of cotton cultivation.

Farmers

The study encompassed a diverse group of farmers, including smallholders and large holders, both men and women. It also considered variations in irrigation methods, with some farmers utilizing solar power while others relying on diesel generators for pumping water, which is very costly.

The study found that in Abyan governorate, two distinct types of cotton are grown: extra-long and short-staple cotton. In Lahj, the primary variety cultivated is short-staple cotton, chosen for its suitability to the local conditions.

Cultivation Season

Cotton season extends from January to August, spanning approximately seven to eight months. Throughout this period, farmers engage in cultivation, which involves multiple cycles of cotton picking, typically up to eight times after the first picking that takes place three months after planting.

Emotional attachment

Despite the numerous challenges encountered, farmers expressed a strong affinity for cotton cultivation, considering it their preferred agricultural crop, even amidst other options such as vegetables, fruits (such as henna, forage, lemon, tomato, watermelon, melon, sesame, wheat, and onion).

Some consulted farmers reported that while some of them temporarily discontinued cotton cultivation due to perceived lower profitability, they ultimately resumed it, emphasizing the cultural significance of cotton farming as a national heritage. Farmers eagerly anticipate accessing higher-quality seeds that exhibit enhanced dryness resistance while yielding improved quality and quantity of cotton output. This desire for superior seeds aligns with their increased productivity and sustainability aspirations.

Cotton Gins

Abyan

In the cotton region of Abyan, the establishment of a gin in the early 1950s played a significant role in the industry. The gin's main function is to process harvested cotton by separating seeds from fibres and preparing it for further processing. However, its current production capacity has significantly decreased, with only 15 workers available compared to its previous labor capacity of 400. In the past, the gin produced 36 million pounds of cotton per season, but now it produces only 150,000-200,000 pounds. The gin operates for one season, receiving cotton from farmers in March and conducting ginning activities from April to September. It purchases cotton from farmers at a rate of 300YER per pound with 2YER deducted as Zakat. In 2022, the selling price increased from 200YER to 300 per pound due to the rise in production costs. The gib distributes 100 bags of 90 pounds each to 100 farmers. In the past, 1000 bags of 150 pounds each were distributed to 2000 farmers. Notably, there is no association for cotton producers to take the lead in such a process.

Gin achines need urgent maintenance or replacement /YFCA

The gin no longer bears the costs of fertilizers, transportation, fuel, and tillage that used to be covered. It is important to mention that the gin stopped operating from 2011 to 2017 due to the war, and both old and new plants suffered damage from airstrikes. A small plant that produces cotton oil is attached to the gin. The gin's main mechanic role is to extract the seeds and compress cotton. In terms of the SWOT analysis, the gin faces several challenges. There is no operational budget, and the old machinery requires maintenance and modernization with limited availability of spare parts. The gin provides work opportunities to 48 male and female seasonal workers and benefits from the availability of electricity. However, the war and instability in the region pose significant threats. Additionally, black market traders directly purchasing from farmers also affect the gin's operations. Despite these challenges, there are opportunities for the gin to focus on

A gin machine during ginning with the year of production (1955) engraved /YFCA

increasing production and exploring export possibilities.

Recently, there have been new developments in Abyan that have brought hope for the revival of the gin. Through the dedicated efforts of Abyan governor, arrangements have been made to reactivate the gin, albeit at a limited capacity. During a visit to the plant, it was evident that the gin had suffered extensive damage, but the potential for its previous operational capacity was still evident. The presence of motivated workers who were eager to operate the gin at its full capacity was a positive sign. Additionally, there were piles of cotton ready for export, indicating the readiness to resume cotton processing and trade activities. These recent developments offer a glimmer of optimism for the future of the gin and the cotton industry in Abyan.

The gin machines - interior view/YFCA

Lahj

Similarly, in Lahj, a gin was established in the mid-1950s, further strengthening the cotton industry in the region. The gin served as a vital processing facility, contributing to the growth and development of the local cotton sector. It played a critical role in preparing the cotton for market, ensuring quality standards, and facilitating trade.

However, while Lahj gin is completely discontinued, Abyan gin has faced operational challenges over the years. Maintenance and upkeep of the ginning machinery posed continuous challenges, requiring regular repairs and

upgrades. Limited access to spare parts and technical expertise added to the difficulties in maintaining smooth operations. Additionally, the conflict cycles of 1994 and 2011 caused significant disruptions, leading to damage and destruction of the gin facilities, interrupting their operations and causing substantial losses.

Internal and external export:

In Abyan, there are ample reserves of cotton stacked in the gin, ready to be exported abroad. On the other hand, in Lahj, the majority of cotton production is primarily sold within the domestic market. Wholesale traders in Sana'a collect cotton from different areas and then resell it to small gins that produce cotton mattresses usually used in Yemeni Majlis rooms. KIIs indicated that some plants' end products are exported to Saudi Arabia, which gives a good opportunity for chain expansion.

Producers:

The producers or processors involved in cotton run showrooms to sell mattresses, with small workshops attached to them, where the mattresses are prepared in custom bags and sewn. Several producers were interviewed, and the following findings were concluded:

Piles of cotton at a wholeseller yard /YFCA

- Key producers have their own gins to process cotton bought from Tehama and Lahj. High-quality gins extract seeds efficiently, which are then sold as seeds. Lower quality gins break the seeds, and these are used as animal feed.
- Only one-third of the processed cotton yields pure cotton, while two-thirds are seeds, which are resold to Tehama.
- Most producers reported ceasing purchases from Lahj due to high transportation costs.
- Producers sell cotton at 800 – 1200YER per kilo, depending on the season and quality, and sell it for 1200 – 1500YER per kilo, yielding an average net profit of 200YER per kilo.
- Syrian cotton is available but is of lower quality, priced at 500YER per kilo.
- Cotton production is labor-intensive production, as creating cotton mattresses requires five times more work compared to modern alternatives.
- There is a high potential for exporting to KSA as still used to be before the conflict. However, high transportation costs and fees, particularly due to the closure of the Hardh land port with KSA, pose significant challenges.

End users:

In the past, mattresses were entirely made of cotton, which was preferred for its superior comfort and durability. However, today, only a few people who can afford it purchase these cotton mattresses. Cotton is sold to end consumers at approximately 1200YER per kilo.

Vertical Value Chain

MFIs

A very limited number of farmers and stakeholders consulted reported their experience in obtaining loans[9]. The analysis revealed some challenges in accessing microfinance institutions (MFIs) for cotton farmers, which are listed as follows:

1. Reluctance to seek loans: Many farmers hesitate to approach microfinance institutions due to difficulties in dealing with them and concerns about their ability to repay the debts, resulting in limited loan uptake.

2. Complex procedures: The requirements of providing large guarantees or owning significant assets act as barriers for farmers seeking loans. For example, when a farmer needs one million YER, he has to bring two individual guarantees or two big stores owners, which makes the loan application process challenging.

3. High interest rates and repayment terms: Microfinance institutions often charge high interest rates, such as 18% for one year and 27% for terms exceeding 18 months. Additionally, the requirement to make monthly instalments and settle the debt even before corps production poses further challenges for farmers.

4. Ownership documentation: Young farmers face another issue as their lands are still under their fathers' names. Microfinance institutions may not accept such documentation as collateral for loans.

5. insufficient marketing support: Farmers demonstrated a limited understanding of microfinance institution (MFI) procedures, indicating a need for increased marketing efforts by MFIs to communicate their services and benefits to farmers effectively.

6. Limited access to zero-interest loans: Farmers indicated that they hear about opportunities where zero-interest rates are offered, but nepotism or favouritism may restrict access to such loans, with only certain individuals or groups receiving such financial support.

[9] Some KIIs indicated they used to get loans from the Yemen Women Union and Tadhamon Islamic Bank.

Improving access to microfinance for cotton farmers necessitates addressing these challenges through implementing simplified procedures, reduced interest rates, flexible repayment terms, acceptance of alternative collateral, and ensuring equitable access to financial opportunities. These measures will empower farmers to effectively access MFIs, generate income, and repay their loans.

Ministry of Agriculture and Irrigation (MAI) Office in Tuban and Khanfar:

The outcomes of the interviews conducted with the Ministry of Agriculture and Irrigation MAI Offices in Tuban and Khanfar highlight the challenges faced by the cotton industry in Tuban and suggest potential areas of improvement and support needed from various stakeholders to revitalize and enhance cotton cultivation in the region.

The outcomes per district are as follows: Tuban

1. **Decrease in Cotton Cultivation Area:** The current area under cotton cultivation in Tuban is only about 1% of the previously cultivated land. Out of the 8,000 farmers in Tuban, only 3% of them currently cultivate cotton. Besides, more than 5082 acres were dedicated to cotton around 12 years ago, but the negative turning point abolished all that. Farmers' interest in vegetables was very limited, and it was cultivated for household consumption before it turned out to be the first interest, replacing cotton. The absence of a functioning gin is cited as the main reason for this decline. Despite many challenges, some farmers continue to plant cotton driven by their own efforts and motivation.
2. **Tuban Development Authority:** The Tuban Development Authority ceased its activities after the war. It was the main body supporting cotton cultivation.
3. **Cotton gins:** while the cotton gin in Lahj completely ceased operation, the gin in Abyan was destroyed and works with its minimum production. There is a crucial need for new gins with updated machinery, as the current machines are obsolete.
4. **Qualified Extensions:** Qualified extension workers are available to support and guide farmers in the region. However, no campaigns are initiated due to operational budget limitations, and the prevention office has become less active in carrying out regular activities. However, farmers often seek advice and support from extension workers, and they respond positively. He pointed out that several diseases affecting cotton trees were mentioned, including 'Gummosis bollworms', passerine insects, and redness of leaves.
5. **Lack of Associations:** There are no specific associations for cotton producers, except for the water users association. The whole trader has significant control over the price of cotton.
6. **Support Needed by MAI:** The MAI office expressed a need for support in value chain analysis and development and the qualification of new extension workers. Introducing modern irrigation networks is also seen as a necessary improvement.

Outcomes of the MAI-Khanfar Interview:

1. **Limited Role of Extension Workers:** The role of extension workers in Khanfar is currently limited due to operational constraints. However, they are responsive to farmers' calls and assist when needed.
2. **Irrigation Sources**: The main sources of irrigation in Khanfar are valley streams, accounting for 70% of irrigation, followed by wells, which make up the remaining 30%.
3. **Yield:** The average yield of cotton per acre in Khanfar is reported to be 800 pounds.
4. **Diseases Affecting Cotton:** Several diseases affect cotton in Khanfar, including root rot, manna, and infestations of American and Sudanese cotton worms.
5. **Decline in Cotton Cultivation:** There has been a significant decrease in cotton cultivation in Khanfar, primarily attributed to pricing issues, the lack of access to loans, and the efficiency of the gin. It is worth noting that the gin was restarted in 2021.
6. **Absence of Farmers' Association:** Currently, no farmers' association is specifically dedicated to cotton growers in Khanfar. Establishing such an association is crucial for farmers to enhance their productivity and address common challenges.
7. **Gin's Influence on Prices**: The gin plays a central role in controlling cotton prices in Khanfar.
8. **Support Needed:** The MAI office in Khanfar requires support in terms of capacity building in areas such as marketing, extension agriculture, and modern irrigation systems. They also seek operational support and tools to enhance their effectiveness.

Cost analysis

Costs associated with cotton cultivation vary between fixed costs throughout the season, and variable costs and generally include the following:

Labor Costs:

Local labourers are predominantly employed in cotton cultivation. Men are paid 4,000YER a day, while women receive 2,000YER, as many of them work half-days. Working hours are typically from 7-11 AM, and the afternoon is between 02-06 PM. Payments are usually made in cash.

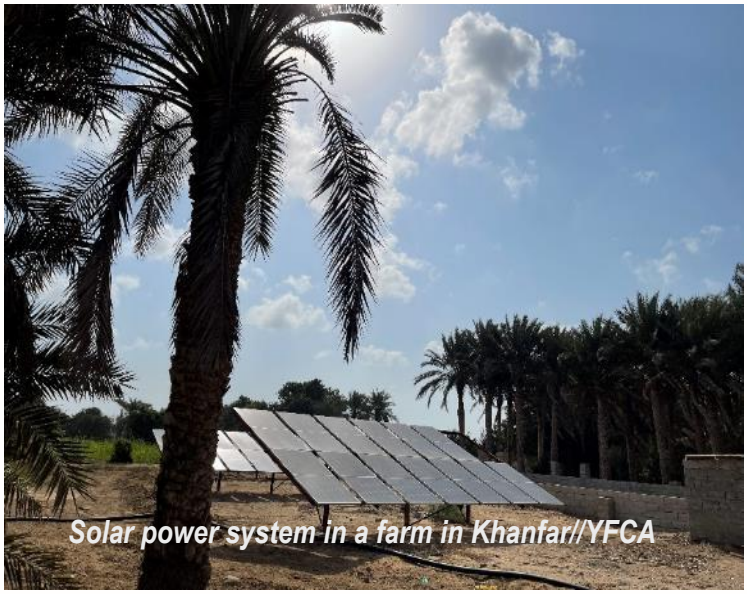
Many KIs agreed that seven workers are required for a 10-acre plot, costing 700,000YER (70,000 per acre). During harvest, an additional 20-30 female workers are needed for 12 days, costing 4,000YER a day (120,000 per acre).

Tillage:

Tillage costs up to 2,500,000YER per season for a 10-acre land. Before sowing, the tillage process with tractors includes soil preparation, removal of harmful weeds, and levelling. Each acre requires two hours for soil preparation, costing 3,000YER per hour. An additional two hours are spent on removing harmful weeds, and two hours are dedicated to levelling the land. Finally, one hour is allocated for diving into squares in preparation for watering. Seeding is typically done manually, with around 10 women working for one day.

Irrigation:

Cotton irrigation relies on both streams and wells. However, there has been an increasing dependency on wells due to climate change-related issues. Factors such as limited rainfall and reduced water quantity in streams have led farmers to rely more heavily on well water for irrigation purposes. Watering is conducted three to four times every 10-15 days, followed by the first cotton picking. In a later stage, 15 – 20 irrigation times are required during the cotton production cycle. It is conducted every 25 – 30 days. Farmers reported that distanced irrigation reduces production.



Solar power system in a farm in Khanfar//YFCA

When solar power is utilized, the primary energy source for most farmers, the irrigation cost for a 10-acre land amounts to approximately 8 million YER. Most of this cost is attributed to labourers' wages, which range between 6000YER and 10000YER. In addition, farmers, particularly large-scale ones who supply water to their own land and smallholder farms, rely on electricity from the public electricity corporation as solar power alone is insufficient to meet their energy needs.

Farmers who do not have access to solar power pumping generators incur additional diesel usage costs. Farmers reported that a one-time irrigation session for channelled land requires 8 hours and consumes 40 litres of diesel, which amounts to 70,000YER. For lands with ponds, an irrigation session takes 12 hours and consumes 60 litres of diesel, costing 105,000YER.

Fertilizers and Pesticides:

Most farmers reported that chemical fertilizers are not considered due to affordability issues. Instead, they rely on chicken waste for nutrient supply, which results in a limited yield volume. However, they reported the use of pesticides, which incur a cost of 1 millionYER for a 10-acre land.

Transportation Costs:

Transporting inputs amounts to 50,000YER while transporting the harvested yields is also another cost item.

Crop yield and sales:

Cotton yield in the absence of fertilizers ranges from 800 kg to one ton per acre. However, by utilizing chemical fertilizers, the yield can increase to 1.5 tons per acre. A typical 10-acre farm produces around 500 sacks of cotton, with each sack weighing approximately 120-130 pounds (57 kg). It's important to note that the quantity decreases in the subsequent seven pickings after the first one.

In Abyan, the selling price per pound is 300YER (200YER in the past two years), while in Lahj, the measurement unit used is kilograms (KG)10, and cotton is sold for 700YER per KG. In Abyan, farmers directly sell to Al Kawd gin, whereas in Lahj, wholesale buyers approach the farmers for purchase.11

Based on the above analysis, during the first picking, a farmer typically recovers around 50% of their investment costs. However, the remaining investment costs and additional profits are obtained in the subsequent pickings. It's important to note that the productivity of the crop is not consistent across the subsequent pickings. Several variables, such as weather conditions, the application of fertilizers, watering quantity, additional costs if incurred and other factors, can impact both the profitability and productivity of the crop.These variables introduce fluctuations and uncertainties in the overall financial outcomes for the farmers.

Wholesale buyers

In Lahj, wholesale buyers perform mediator roles and are crucial in the cotton value chain.They purchase cotton from farmers and facilitate its onward sale to other traders. Some of them also have additional roles, such as supplying seeds and water for irrigation, which are paid upon yield sales.

The analysis indicates the existence of a limited number of traders, reflecting a lack of competition and limited offers available to farmers.The relationship between farmers and wholesale buyers is typically long-term, with farmers relying on specific traders without exploring alternatives.

[10] (pound=0.45 KG)

[11] Some KIIs revealed that in Abyan black market wholesalers occasionally approach farmers to purchase their yields, although this practice is limited in scope.

Wholesale buyers buy small-scale farmers' produce at a price of 700,000YER per ton (1 KG is sold for 700YER) and then sell it for 800,000YER (equivalent to 2,000 Saudi Riyals).12 Wholesale buyers reported selling 15 to 20 tons of cotton per season, generating a net profit ranging from 1 million to 2 millionYER. Other sources reported that wholesale buyers sell cotton to wholesale traders for 1,200,000YER, which increases the profit margin considerably. Moreover, farmers and also wholesale buyers indicated that they pay no taxes.

Limited production

A wholesale buyer, KI, reported sourcing cotton from 20 to 30 farmers across various subdistricts inTuban, including Massaabain, Afyoush, and Dar Manaserah. However, the limited production capacity of individual farmers, who typically cultivate between one to two acres, fails to meet the overall demand.

Wholesalers dominance

In Lahj, a distinct model is observed where wholesalers provide farmers with credit for seeds and irrigation support. In return, these wholesalers purchase the entire cotton production.The farmers' loyalty to these wholesalers, due to their support, makes it difficult for them to explore alternative options or replace them in the value chain.Typically, these wholesalers are also well owners who receive a share of the farmers' profits. If solar power is used for irrigation, the well owner receives 40% of the farmers' profit. In the case of diesel-powered irrigation, the well owner receives 25% of the profit plus the diesel costs. It is worth mentioning that the wholesaler does not add value to this arrangement. No quality check is performed on the production.

One of the issues wholesalers face appears when there is a delay between production and selling as the weight of a sack full of cotton is reduced from 50 kg to 48 or 47 due to moisture in the storage process, which then poses losses threat to them.

World price of cotton

[13]According to data from Macrotrends.net, which shows an interactive chart of historical daily cotton prices back to 1969.The price shown is in U.S. Dollars per pound. The current price of cotton as of July 02, 2024 is **$0.7200** per pound. In contrast, the above analysis indicates that the local selling price is approximately **$0.187** per pound. This significant difference highlights a substantial gap between the local and international selling prices of cotton.

[12] Due to the currency change between northern and southernYemen and the consequences of the conflict, traders from the north pay only in Saudi Riyals. However, the exchange rate volatility influences the pricing dynamics.
[13] https://macrotrends.net/2533/cotton-prices-historical-chart-data

Other issues

Association membership

The analysis revealed the absence of an active union or association for cotton producers in Lahj or Abyan. It seems that farmers lack a union culture and primarily focus on their individual cultivation work. While some farmers belong to water users' associations, there is currently no specific association for cotton producers.

Establishing a cotton-producing association would significantly enhance cotton cultivation and its related activities. Such an association could provide numerous benefits, including:

1. **Collective advocacy:** The association can represent the interests of cotton farmers, advocating for their needs and concerns at various levels, such as government policies, market access, and infrastructure development. This can ensure that their voices are heard and policies are tailored to meet their specific needs and challenges.

2. **Knowledge sharing, capacity building, and research:** The association can serve as a platform for knowledge sharing among members, facilitating the exchange of information and best practices. It can also collaborate with agricultural research institutions to undertake research activities focused on improving cotton cultivation, addressing pest and disease management, and promoting innovation in the sector.

3. **Access to resources and support:** The association can act as a platform for accessing resources, including financial assistance, inputs, and machinery. It can also collaborate with relevant institutions to provide training, technical assistance, and extension services to its members.

4. **Market linkages and price negotiation:** when functioning as a collective entity, the association can negotiate better prices for cotton produce and establish direct market linkages. This can help farmers secure fair prices, reduce dependency on intermediaries, and enhance their overall income.

5. **Research and development:** The association can collaborate with research institutions and experts to undertake research and development activities focused on improving cotton cultivation, addressing pest and disease management, and promoting innovation in the sector.

Overall, establishing a cotton-producing association would create a unified platform for cotton farmers, fostering collaboration, knowledge sharing, and collective action. It would strengthen the cotton sector, promote sustainable practices, and improve the overall livelihoods of farmers in the region.

Farmers' Numeric Illiteracy

An important observation among farmers is the presence of numeric illiteracy, which refers to a lack of understanding and proficiency in numerical calculations. This illiteracy has significant implications for their cultivation practices and decision-making processes. Farmers have been noticed to exhibit instances of numeric illiteracy, particularly in relation to accurately calculating prof

it, cost allocation, and engaging in effective planning. They struggle to determine the financial outcomes of their farming operations accurately. They may perceive the act of calculating as burdensome or overwhelming and consequently avoid it altogether. This lack of understanding prevents them from making informed decisions regarding inputs, pricing, and overall profitability. Consequently, they may not fully comprehend the financial implications of their choices, leading to suboptimal resource allocation and potentially reduced profitability.

The consequences of numeric illiteracy among farmers can harm their long-term success and sustainability. Farmers may struggle to optimize their resources, make effective investment decisions, and plan for future growth without a clear understanding of their costs, profits, and financial implications. The lack of numeracy skills prevents them from adopting efficient farming practices, optimizing resource allocation, and maximizing profitability.

Addressing the issue of numeric illiteracy among farmers requires targeted interventions and support. Providing basic financial literacy training and education can equip farmers with the necessary numerical skills to understand profit calculations, cost allocation, and effective planning. Training programs can teach farmers how to track expenses, calculate profits, and make informed decisions based on financial analysis to gain better control over their financial management, improve their decision-making processes, and ultimately enhance their cultivation practices' overall productivity and profitability.

Gender-Related Roles in Cotton Cultivation

Cotton cultivation involves distinct gender-related roles, with women widely present in various aspects of the process. While men typically handle tasks that require physical strength, such as irrigation, women play essential roles in planting, picking, and removing harmful weeds.

1. Men's Roles: Men are often responsible for tasks that involve physical labour and require more strength. These tasks may include watering the crops, trimming plants, and removing harmful weeds. Men's involvement in irrigation is particularly crucial, as it requires physical power to operate and maintain the necessary equipment.

2. Women's Roles: Women play a significant role in cotton cultivation, especially in activities such as planting, picking, and removing harmful weeds. They are actively involved in the process of planting cotton seeds. Additionally, women are commonly engaged in the labour-intensive task of picking cotton.

It is worth noting that young men are prevalent in the cotton cultivation process. They actively participate in tasks that require physical strength and contribute to the overall cultivation efforts alongside women.

The division of labour based on gender roles in cotton cultivation reflects traditional practices and cultural norms within the community. However, it is important to recognize that gender roles can be fluid, and the involvement of women in traditionally male-dominated tasks is increasingly recognized and valued.

Promoting gender equality and empowering women in cotton cultivation is essential for sustainable development. Providing equal access to resources, training, and opportunities for women in all aspects of cotton farming can improve productivity, increase income, and enhance social well-being in agricultural communities.

Quality Control in Cotton Cultivation

Ensuring quality control in cotton cultivation is crucial for maintaining the overall value and marketability of the crop. However, there are certain observations and practices related to quality control in the context of cotton cultivation that deserve attention.

1. Perception of Quality: Consulted farmers often perceive their cotton crop to have the best quality. This subjective perception may stem from their familiarity and attachment to their own produce. However, objective quality assessment is vital to determine the actual grade and value of the cotton.

2. Role of Specialists: In the past, a specialist would inspect the quality of cotton at the gin, and pricing would be determined accordingly. However, it is noted that this specialist role is no longer in effect, and a single price is now applied to all cotton. This change may overlook variations in quality and potentially impact the fairness of pricing.

3. Quality Variation: The quality of cotton can vary depending on the picking stage. The first and second pickings are generally associated with the highest quality, while subsequent pickings may exhibit decreased quality. It is important to consider this variation in terms of crop management and marketing strategies.

It is important to implement a system of purchasing cotton based on grades, with an appropriate price difference between grades. Besides, proper training should be provided to specialized sorters to ensure efficient and accurate sorting of cotton.

4. Limited Involvement of Agricultural Authorities: The Ministry of Agriculture offices appear to have limited involvement in the quality control process. This suggests a potential gap in regulatory oversight and support for maintaining and improving cotton quality standards. Extension workers are called upon when needed, particularly in situations requiring the application of pesticides or other agricultural interventions. Their involvement in quality control may be limited to addressing specific issues or challenges rather than comprehensive quality assessment and management.

To enhance quality control in cotton cultivation, robust mechanisms for objective quality assessment and pricing must be established. Reintroducing specialized inspections or implementing standardized grading systems can help ensure fair pricing based on actual quality. Additionally, strengthening the role of agricultural authorities in quality control and providing guidance to farmers on best practices for maintaining and improving cotton quality can contribute to sustainable and competitive cotton production.

Climate change challenge

Climate change has adverse effects on cotton cultivation, including higher temperatures, altered rainfall patterns, and increased vulnerability to pests and diseases. These changes disrupt optimal growth conditions, leading to reduced yields and lower fibre quality. Erratic weather events, such as droughts or heavy rainfall, further exacerbate these challenges, affecting the availability and quality of water resources and impacting irrigation practices.

To address these impacts, the following recommendations aim to mitigate the negative impact of climate change on cotton:

1. Rely on Adapted Local Varieties: Agriculture research needs to study and capitalize on the knowledge gained from cultivating adapted local cotton varieties that have demonstrated resilience to local climate conditions and can serve as a valuable resource for future breeding programs. Besides, there is a need for an adaptation strategy, including adjusting planting schedules.

2. Improve Local Varieties: Invest in research and development efforts to enhance the performance of local cotton varieties, specifically focusing on breeding for traits such as drought, heat, and salinity resistance. This can be achieved through collaborations with agricultural research institutions and the utilization of modern breeding techniques.

3. Sustainable Water Management: Given Yemen's status as one of the poorest countries in terms of water resources, the changing climate patterns and shifting water availability make it crucial to adopt sustainable water management practices. This includes expanding and implementing efficient irrigation systems, promoting water-saving techniques, and exploring alternative water sources such as rainwater harvesting.

SWOT Analysis of Cotton Cultivation:

This SWOT analysis below highlights cotton cultivation's internal strengths and weaknesses and the external opportunities and threats it faces. It provides a comprehensive overview of the factors that influence the success and challenges of the cotton industry in the given context.

Strengths:

1. **Fertile Land:** The presence of fertile land provides a favourable foundation for successful cotton cultivation.

2. **Water Availability:** The region benefits from sufficient water availability, ensuring an accessible irrigation source for cotton cultivation.
3. **Heritage and Tradition:** Cotton cultivation holds cultural and historical significance, contributing to preserving local traditions and practices.
4. **Disease and Pest Resistance:** Cotton species exhibit resistance to diseases and pests, minimizing the severity of infestations and reducing the need for extensive pest control measures.
5. **Efficient Utilization of Goods:** Cotton production results in various by-products[14] that can be utilized effectively, reducing wastage and maximizing the value derived from the crop.
6. **Production Potential:** Cotton cultivation has the capacity for significant production output, enabling farmers to meet the increasing market demands and potentially generate substantial revenue.

Weaknesses:

1. Limited Season: Cotton cultivation is constrained by a specific growing season, which limits the opportunity for year-round production and income generation.

2. High Costs: Cotton cultivation incurs high costs for tillage, labour, seeds, and fuel, which impact the crop's profitability.

3. Labor-Intensive: Cotton cultivation requires a significant labour force throughout the season. While the first two pickings are profitable, labour costs remain fixed as the number of cotton decreases.

4. Price Control: Traders exert control over cotton's price, potentially limiting cotton farmers' profitability and bargaining power.

5. Lack of Competitiveness: The absence of importers and limited competitiveness in the market hinder the growth and market reach of locally produced cotton. Imported sponges dominate the market.

6. Limited Capital: Insufficient capital challenges expanding cotton cultivation and investing in improved practices. However, the potential for training existing workers exists.

7. Pests: The presence of pests poses a threat to cotton cultivation and requires effective pest management strategies.

8. Limited Production and Buyers: Cotton production is currently limited, and potential buyers for the crop are scarce.

Opportunities:

1. Microfinance Organizations: The presence of recently established microfinance organizations presents opportunities for accessing financial resources and support for cotton cultivation.

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[14] Oil and animal fodder are valuable byproducts derived from the processing of cotton seeds. Fodder results when seeds are poorly extracted, leading to broken seeds, while oil is obtained through the squeezing of seeds. Cottonseed oil is commonly used in soap production; however, due to a lack of awareness, people often produce low-quality soap.

2. Cotton Oil Production: The coexistence of cotton cultivation and oil production in the region offers potential synergies and opportunities for diversification. Besides, cotton seeds extract a nutrient feed that can be sold to animals breeders.

Threats:

1. Export Limitations: The country's current context may restrict export opportunities for cotton, impacting market access and potential revenue.

2. Climate Change: Climate change and decreased stream availability for well irrigation pose challenges to water availability for cotton cultivation.

3. Lack of Extension Services: The absence of extension services limits farmers' access to technical knowledge and guidance, hindering their ability to implement best practices.

4. Non-functioning Gin: Non-functioning cotton gin creates obstacles to processing and adds value to the cotton crop.

5. Lack of State Support: The absence of comprehensive state support for the cotton industry hampers its growth and development.

6. Limited Local Processing Plants: The absence of local cotton processing plants contributes to the market's dominance of cheaper imported sponges.

Conclusion: Challenges and Strategic Insights

Cotton value chain in the Khanfar district of Abyan and the Tuban district of Lahj, Yemen, is marked by its historical significance and economic potential. However, several critical challenges threaten its sustainability and growth which are listed as follows:.

- High Costs and Absence of Gins:

The high costs associated with cotton cultivation, including tillage, labor, seeds, and fuel, pose significant challenges for farmers. The absence of functional ginning facilities further complicates processing and value addition to the cotton crop.

- Technical and Agricultural Issues:

Farmers' failure to adhere to technical recommendations, violations of planting dates, and neglect of agricultural operations (such as thinning, loosening, and weeding) lead to reduced productivity. Weak extension activities exacerbate these issues.

The lack of modern pesticide technology for controlling herbicides in cotton fields results in a productivity reduction of 20% to 40%.

- Seed Quality and Availability:

The lack of improved seeds is a critical problem that hampers productivity and crop resilience.

- **Farming Practices:**

Farmers often prioritize other crops over cotton, planting multiple crops such as peanuts, sesame, cowpeas, and fodder in cotton fields.

Cotton is cultivated at long distances between lines and plants, resulting in decreased production.

Delays in the cotton harvesting process lead to contamination of cotton with crop residues and weed seeds, reducing its quality.

Inadequate pest control measures lead to decreased production and deterioration of cotton properties.

- **Unfair Pricing:**

Current cotton prices need to increase to 500YER per pound to ensure fair compensation for farmers' efforts and investments. The local price should be aligned with the world price of cotton to make it more profitable for farmers.

- **Quality Control Issues:**

Purchasing traders setting a unified price for all grades of cast cotton leads to mixing grades and decreased quality levels.

Despite these challenges, opportunities exist to revitalize the cotton industry. The findings highlight the need for improved seed supply systems, enhanced technical support, and modernized ginning facilities. The involvement of microfinance institutions (MFIs) could provide the necessary financial support for farmers. Addressing climate change impacts and promoting sustainable water management practices are crucial for the future of cotton cultivation.

Recommendations and Suggestions

1. **Strategic Seed Supply System:**
   Revitalize Ginning Facilities: Reactivate and modernize ginning facilities in Lahj and Abyan to ensure a steady supply of high-quality seeds and improve overall value chain efficiency.

   Strengthen Seed Breeding Foundation: Provide technical expertise, infrastructure investment, and establish partnerships to enhance seed quality and availability.
2. **Capacity Development and Support:**
   Enhance Agricultural Extension Services: Strengthen extension services to provide farmers with technical support, pest management strategies, and best practices for cotton cultivation.

   Training and Education Programs: Implement financial literacy and agricultural training programs to improve farmers' understanding of cost management and profitability.
3. **Sustainable Resource Management:**

Promote Sustainable Water Management: Implement efficient irrigation systems and water-saving techniques to address water scarcity issues exacerbated by climate change.

Invest in Renewable Energy Solutions: Explore partnerships to provide affordable solar power systems tailored to the needs of cotton farmers, reducing reliance on costly diesel generators.

4. Market Access and Fair Pricing:
   Establish Cotton Producers' Associations: Form associations to advocate for farmers' interests, facilitate collective bargaining, and improve market linkages.

   Fair Pricing Mechanisms: Advocate for a fair and higher price for cotton, reflecting its true value and adequately compensating farmers.

5. Policy and Advocacy:
   Government Support: Engage with local and national authorities to develop policies that support the cotton industry, including subsidies, loans, and infrastructure investments.

   Climate Adaptation Strategies: Develop and implement adaptation strategies to mitigate the impact of climate change on cotton cultivation.

ABOUT YFCA

YFCA is a leading, independent, and neutral non-governmental organization that works nationwide at different levels to promote equitable and sustainable development, humanitarian response, and other relevant interventions for the betterment and wellbeing of Yemeni communities and individuals. YFCA works closely with the government, local and international partners, and urban and rural Yemeni communities in an endeavor to complement the efforts of other actors and stakeholders who work towards common purposes.

Cotton Value Chain Analysis Report
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