



Sesame Value Chain Analysis Report

► Abyan and Lahj Governorates, Yemen



June 2024



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Introduction

Yemen has roughly eight times the population of neighboring Oman, three times the population of the United Arab Emirates (UAE), and approximately the same number of people as regional powerhouse Saudi Arabia. The country's population jumped from 18 million to 24 million from 2001-2013. Yemen has one of the largest numbers of mouths to feed in the region on one of the tightest budgets.

Despite common misconceptions of Yemen, it is not one massive, arid desert. The country has five distinct agro-ecological zones and while its bodies of water may be few, Yemenis have been practicing terraced agriculture on the country's steep hillsides for millennia. Terraced farming, which works for several different types of crops, is built on hillsides and minimizes water wastage. As run-off water flows down into an adjacent field it provides water to the next crop and helps prevent soil erosion.

Yemen mainly produces sorghum, a particularly drought-resistant cereal, as well as potatoes, wheat, corn, and chickpeas. While the country does produce some food, it does not produce nearly enough for domestic consumption, nor does it produce many of the foods that its citizens have developed a particular taste for. In 2013, with a gross domestic product (GDP) of \$36 billion, Yemen spent \$145 million on corn imports, \$363 million on rice, \$400 million on sugar, and a staggering \$1 billion on wheat imports. The price of food in Yemen is simply a reflection of the international price of food—a reality which, for the past several years, has been a very bad thing for the country.

Events in Yemen over the past several years make sense when they are viewed through the lens of politics. But they make even more sense when contextualized in regard to food. While the Yemeni government has historically offered some subsidies to its farmers, they have been relatively modest and therefore so have been the policies' results. Neighboring Oman, for example, provides more aggressive and effective agricultural support programs, and the average yields for an Omani wheat farmer are nearly twice those of their southwestern neighbors.

This shortcoming in productivity helps feed the dependency on imports, which ultimately means vulnerability to external price shocks. Yemen was at the mercy of the global commodity crisis of 2008, and again during a secondary price spike in 2011. These global shocks were occurring as domestic food security dwindled during a time of drought in 2008 and 2009.

These shocks happened in the context of chronic food insecurity. More than half of Yemeni children suffer from stunted growth, giving the country a level of malnutrition in children second only to Afghanistan. The prevalence of food inadequacy, which is a calculation based on the number of calories that would be necessary to sustain moderate physical activity, is about 36 percent. This means more than one-third of Yemenis do not have enough food. And while poverty and malnutrition rates have been falling in many parts of the world, they have remained unwaveringly high in Yemen.



World Sesame Production

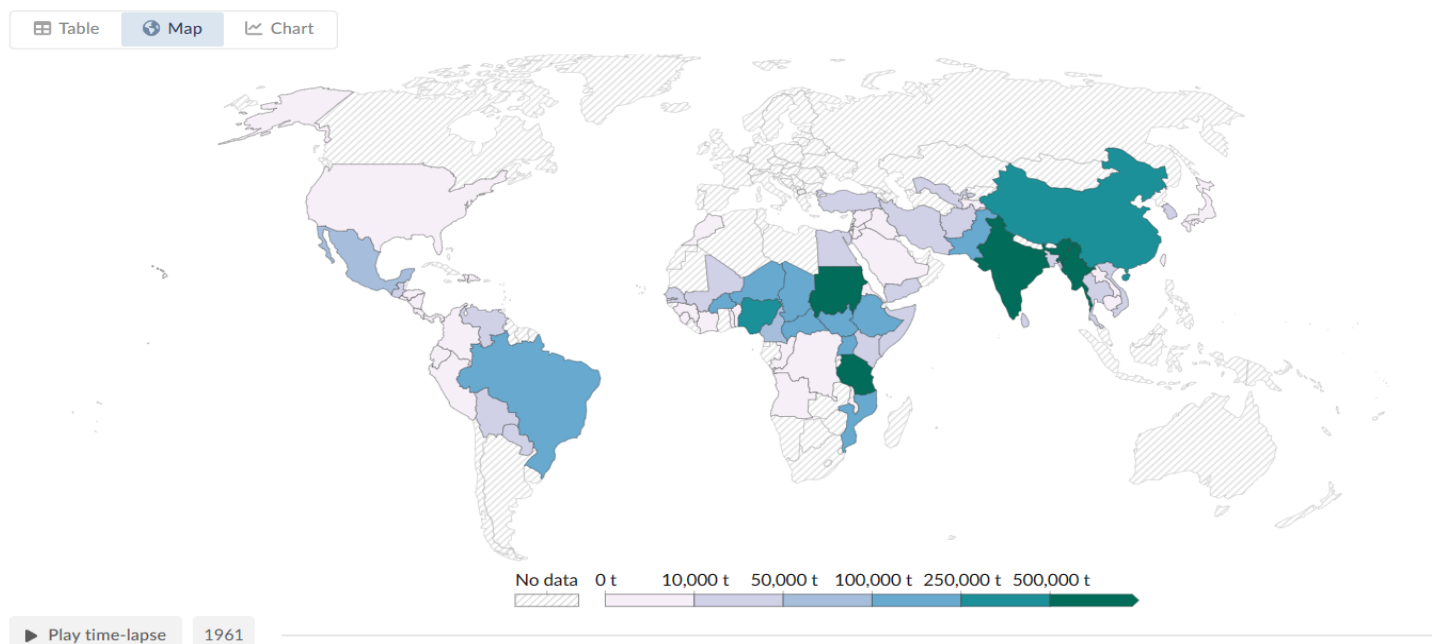
Sesame ranks as the ninth amongst oleaginous crops in the world (Saha et al., 2014). Global production of sesame seed is estimated by FAO at 3.15 million tons in 2001 having risen from 1.4 million tons in the early 1960s (Chemonics International Inc, 2002). In 2008, the total world sesame production was about 3.54 million tons, grown on 7.42 million hectares (Chemonics International Inc, 2002). In 2012, the production reached 4,441,620 tons, covering 7,952,407 hectares with an average yield of 558.5 kg/ha. From 2012 to 2016, World sesame production has known a boom with a production of 12.22 million tons (Girmay, 2018).

Sesame is grown in many parts of the world on over 5 million acres (20,000 km²). Out of the 22 countries who are the major producers of sesame in the world, 6 are in Asia, 13 in Africa and 3 in Latin America (Central and South America). Myanmar, India, and China are the highest producers, while Mali, Bangladesh, Paraguay and Benin are the least producers. FAO statistics reveal that these major sesame-producing countries together account for 92.6% of the world sesame production (UNSD, 2017; FAOSTAT, 2022). India remains the major producer of sesame accounting for more than 40% of the world's sesame area and 27% of world production. Seventy percent of the world's sesame crop is grown in Asia, with Africa growing 26% (Zerihun, 2012). Africa has become second in the world in production, increasing its production by 25% with its seven countries belonging to the largest group of sesame seeds marketers in the world, two of which are in West Africa, Nigeria with 39,800 tons and Burkina Faso with 18,107 tons (Dossa et al., 2017).

Sesame is an important cash crop that can be grown with limited resources. In recent decades it has drawn interests of many researchers and developers.

Sesame seed production, 2022

Sesame seed production is measured in tonnes.





Yemen's production of sesame was at level of 18,605.01 ton in 2022, down from 19,583 ton previous year, this is a change of 4.99%.

Table 1: Yemen's Sesame Production

Sesame Area (HA)& Prod.(MT)In R.Y BY. Provinces 2015-2019						
PROV./YEAR		2015	2016	2017	2018	2019
AL-Hodeidah	Area	8,265	8,254	8,295	10,750	7,017
	Prod.	9,358	9,342	9,388	6,403	5,863
Sana'a	Area	40	37	36	36	41
	Prod.	42	39	38	38	43
Dhamar	Area	19	17	16	16	20
	Prod.	21	19	18	18	22
Ibb	Area	138	135	134	137	137
	Prod.	139	132	131	127	142
Taiz	Area	313	303	300	303	313
	Prod.	300	279	276	279	300
Mareb	Area	3,406	3,400	3,366	3,332	3,440
	Prod.	3,403	3,397	3,363	3,329	4,979
Hajjah	Area	760	745	741	544	861
	Prod.	748	741	748	484	877
AL-Baida	Area	332	309	306	309	332
	Prod.	338	298	295	292	341
Sa'adah	Area	38	37	36	35	39
	Prod.	42	40	39	38	43
AL-Mahweet	Area	29	28	27	23	32
	Prod.	33	34	33	27	37
Lahj	Area	489	465	460	470	487
	Prod.	485	460	455	507	462

Sesame Area (HA)& Prod.(MT)In R.Y BY. Provinces 2015-2019 (continue.....)						
	PROV./YEAR	2015	2016	2017	2018	2019
Abyan	Area	3,762	3,749	3,711	3,692	3,791
	Prod.	3,781	3,780	3,742	3,720	3,810
Hadramout	Area	807	815	807	823	803
	Prod.	854	856	848	831	953
AL-Jawf	Area	1,541	1,535	1,520	1,702	1,458
	Prod.	1,495	1,490	1,475	1,708	1,387
Shabwah	Area	1,644	1,623	1,591	1,384	1,764
	Prod.	1,657	1,638	1,606	1,794	2,287
AL-Maharah	Area	0	0	0	0	0
	Prod.	0	0	0	0	0
Aden	Area	0	0	0	0	0
	Prod.	0	0	0	0	0
Amran	Area	33	31	30	24	37
	Prod.	35	34	33	26	40
AL-Daleh	Area	0	0	0	0	0
	Prod.	0	0	0	0	0
Sana'a City	Area	0	0	0	0	0
	Prod.	0	0	0	0	0
Raimeh	Area	48	53	52	52	49
	Prod.	52	56	55	55	53
Total	Area	21,664	21,536	21,428	23,632	20,621
	Prod.	22,783	22,635	22,543	19,676	21,639
Yield	MT/HA	1.052	1.051	1.052	0.833	1.049

The above table shows the census of area and production of sesame crop in all Yemeni governorates from 2015 – 2019 and shows that Al-Hodaidah governorate has the highest planted areas and productions compared to other governorates, and Abyan governorate comes 2nd and Lahj governorates comes the 8th, which put in mind that Abyan governorate even considered the 1st governorate in the south of Yemen has a good potential to expand in sesame farming.



When we compare the total production in 2019 and 2022 (above) we note that in each year there was a decline on Yemen sesame production about 1,000 ton in each year, that shows that the curve goes down ahead, and this is a serious figure and fact due to the protracted crisis and conflict and unstable situation in Yemen (north and south).

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 sesame is considered an economic cash crop comes after coffee crop. The selection of the sesame value chain for the study is driven by several reasons. sesame holds significant industrial and strategic importance for Yemen, serving as a crucial nutritional commodity and its important by-products: oil and cake/meal which are used in many nutritional meals as a good source of protein and calcium, and it's a main ingredient in manufacturing of Halawah Taheenyah that is very popular, in addition to its use in medicine and industrial manufacturing, moreover, its cake/meal after extracting oil from its seeds contributes as one of the most protein source (35%- 40%) for fattening of livestock. Furthermore, Yemeni local sesame is high quality compared with the external sesame from Ethiopia and Sudan which is imported when the local sesame doesn't fulfill the local market's needs, and this opens a strategic opportunity to strengthen this sub-sector based on market-based solutions approach.

Sesame farming, deeply rooted in the country's economy, remains a vital industry, especially in Abyan governorate that comes after Hodaidah governorate in terms of cultivated areas and production. This report delves into the intricacies of sesame farming in two governorates: Abyan and Lahj due to the high potential to expand sesame farming as its 2 deltas: delta Tuban & delta Abyan which are the most fertile lands in the southern governorates and get benefited from its available floods and valleys streams that irrigate the lands freely without costing any expenses, and carry in its way the most fertile ingredients that enrich lands with all nutritional elements that play a vital role in producing high quality sesame seeds enriched with high quality oil, proteins, and minerals, shedding light on key aspects such as agricultural inputs & seed providers, 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 sub-sector.

Amidst the high significance and economic importance, sesame 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 sesame farming and identifying strategies to enhance productivity, profitability, and sustainability. Through a thorough analysis of the various components of sesame 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 prosperous future for sesame farming in Lahj and Abyan.

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 sesame 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 sesame's challenges were reviewed. These resources provided contextual information and further enriched the analysis, contributing to a comprehensive understanding of the sesame value chain dynamics in the study governorates.

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 sesame 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
- MAI office –Tuban
- Al Kawd Agriculture Research Centre

Business support stakeholders

- Input suppliers
- Wholesale buyer
- Retailers



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



Census on Agriculture and Farmers in both Abyan & Lahj governorates:

The agriculture in Yemen composes 73% of Yemeni population, and is considered the main livelihood and income source for the farmers in Yemen, the below table shows the potential number of farmers who can invest in sesame farming in Abyan and Lahj where they are higher in Lahj governorate than in Abyan governorate, but Abyan governorate is bigger than Lahj in terms of Area, Cultivable Area and Crops Area, and this is why Abyan is advanced in agriculture compared to Lahj. On the other hand, rainfall amount in Abyan is 4 times that is in Lahj governorate, while the irrigated fields by wells and ground water is double in Lahj than in Abyan as per the data in table below.

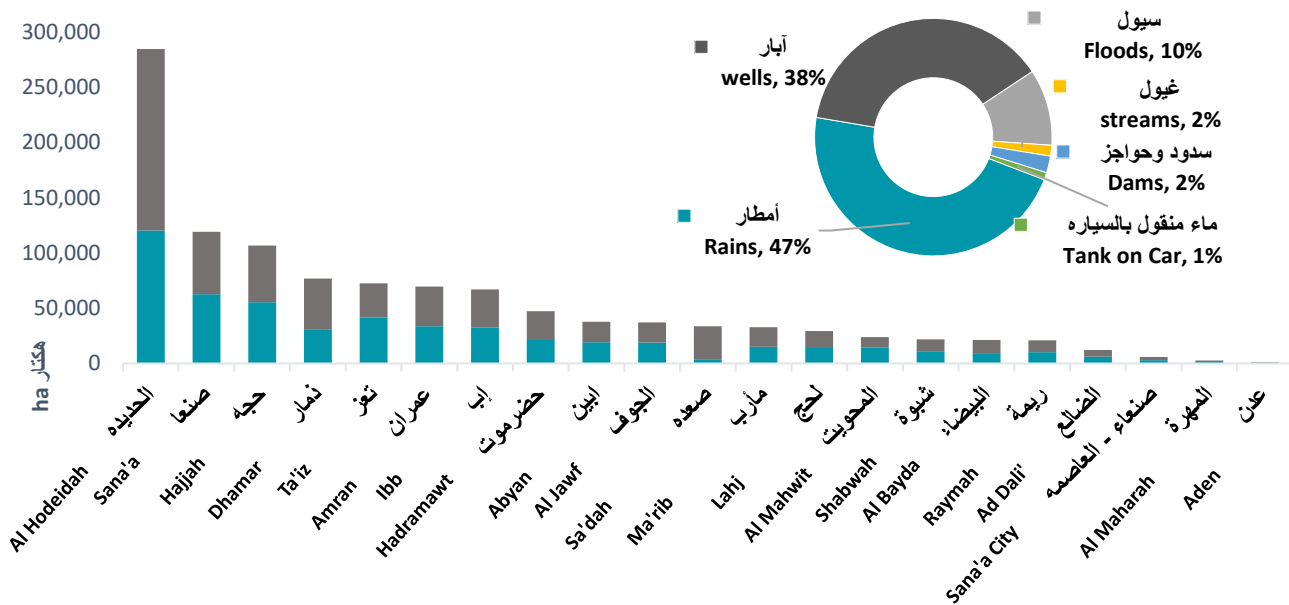
Table2 : Number of Agricultural Holders, Total, Cultivable and Crops Area (Ha) by Source of Irrigation 2019

Number of Agricultural Holders ,Total ,Cultivable and Crops Area (Ha) by Source of Irrigation 2019

GOV.	Irrigations (Well & Rainfall)							Households Number & Agri. Cultivable Area			
	Total irrigation	Tank on Car	Dams	streams	Floods	wells	Rains	Crops Area	Cultivatble	Total Area	No of Agri Holders
AL-Hodeidah	164,139	2,844	8,532	7,997	39,542	105,224	120,249	284,388	314,777	327,107	87,486
Sana'a	56,504	1,192	315	118	1,231	53,648	62,714	119,218	136,596	144,900	88,905
Dhamar	51,157	1,066	3,197	1,071	13,853	31,970	55,408	106,565	136,815	147,076	98,292
Ibb	46,318	769	36	911	9,997	34,605	30,581	76,899	103,296	113,734	111,969
Taiz	30,978	918	2,175	1,087	9,424	17,374	41,518	72,496	58,117	64,067	155,505
Mareb	35,910	697	2,092	340	9,067	23,714	33,837	69,747	107,098	121,487	69,395
Hajjah	34,422	669	669	448	1,204	31,432	32,454	66,876	53,224	56,445	177,614
AL-Baida	25,364	474	1,422	711	6,163	16,594	22,047	47,411	51,715	54,422	40,159
Sa'adah	18,702	378	1,133	567	4,912	11,712	19,080	37,782	60,757	65,071	28,449
AL-Mahweet	18,447	373	1,118	559	4,845	11,552	18,819	37,266	90,972	109,245	28,638
Lahej	29,825	336	1,009	505	133	27,842	3,810	33,635	40,721	50,726	49,113
Abyan	17,657	328	65	154	725	16,385	15,112	32,769	88,886	116,592	14,450
Hadramout	14,514	293	880	440	3,812	9,089	14,806	29,320	26,390	31,804	55,570
AL- Jawf	9,647	69	492	548	872	7,666	14,310	23,957	21,726	27,443	44,698
Shabwah	10,780	218	653	327	2,831	6,751	10,998	21,778	49,373	58,524	22,578
AL-Maharah	11,774	7	636	318	2,756	8,057	9,428	21,202	69,520	74,956	34,778
Aden	10,759	210	630	79	2,731	7,109	10,248	21,007	13,519	14,493	35,994
Amran	6,101	123	370	185	1,602	3,821	6,224	12,325	14,009	15,089	36,680
AL-Daleh	2,967	60	180	90	779	1,858	3,027	5,994	8,725	9,317	7,725
Sana'a City	1,283	26	78	39	337	803	1,307	2,590	3,368	3,973	3,467
Raimeh	625	13	38	19	164	391	636	1,261	2,834	3,013	516
Total	597,873	11,063	25,720	16,513	116,980	427,597	526,613	1,124,486	1,452,438	1,609,484	1,191,981
	53.2%	0.98%	2.29%	1.47%	10%	38%	46.8%	100%			



Figure 1: Water Resources in Yemen



Utilization of sesame

The primary uses of the sesame seeds are as a source of oil for cooking and in the making of rolls, cracker chips of cakes, soup, spices and in jam (Abou-Gharbia et al., 2000). The young leaves may also be eaten in stews, and the dried stems may be burnt as fuel with the ash used for local soap making, but such uses are entirely subordinate to seed production (RMRDC, 2004). The oil is used as raw material to produce paints, margarine, and varnishes (Nyiatagher and Ocholi, 2015). It is used in pharmacology (Anilakumar et al., 2010) and in industries with products such as perfumes, cosmetics for the skin, hair oils and soaps. Sesame oil can be used in the manufacturing of soaps, paints, perfumes, pharmaceuticals, and insecticides. Sesame meal, left after the oil is pressed from the seed is an excellent high protein source (34–50%) and used as feed for poultry and livestock (Bikoko-Pum, 2017).



The Geographic Scope of Sesame Value Chain Assessment:

Abyan Governorate

Abyan Governorate is a Yemeni governorate located to the south-east of the capital, Sana'a, and is 427 kilometers away from it. Its capital, Zinjibar, is connected to the east by Shabwa Governorate, to the west by the governorates of Aden and Lahj, and to the north by the governorates of Shabwa and Al Bayda, along with parts of Yafa' Al Olya. To the south, it is bordered by the Arabian Sea, which its beaches overlook it. The population of the governorate constitutes 2.2% of the total population of Yemen, and the number of its districts is 11 districts. The city of Zinjibar is the center of the governorate. Agriculture and fishing are the main activities for the residents of the governorate, as agricultural crops constitute 4.4% of the total agricultural production in the Republic, and the most important agricultural crops produced in the province are long-staple cotton, vegetables and fruits.



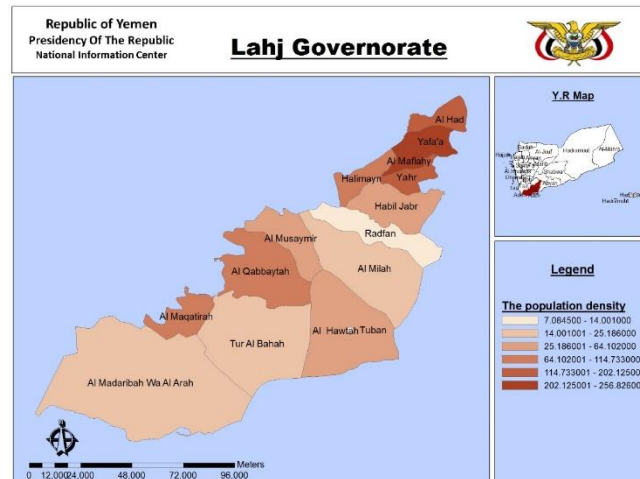
This governorate was subject to British colonial rule, like other southern governorates. Among its most famous districts are Zinjibar and Jaar. This governorate is famous for agriculture, especially the cultivation of sesame and the extraction of its oil, as there are thousands of hectares planted with types of fruits and palm trees, and it is also famous for its livestock.

Lahj Governorate:

Lahij or Lahej (Romanized: Lahj), formerly called Al-Hawtah is a city and an area located between Taiz and Aden in Yemen. From the 18th to the 20th century, its rulers were of the Abdali branch of the Al-Sallami tribe who trace their lineage to one of the 10 tribes of Yaffa called Kalad. Lahij was the capital city of the Sultanate of Lahej, a protectorate of the British Empire until 1967, when the sultan was expelled, and the city became a part of People's Republic of South Yemen. Now it is part of the Republic of Yemen.



It is located in the delta of the Wadi Tuban on the main trade route connecting Aden with Taiz, Ibb, and Sanaa. Lahj is an agricultural governorate and produces about 4% of the total agricultural production of the Republic of Yemen. The most important crops are vegetables and feed crops. Lahj produces construction materials for neighboring Aden and other parts of Yemen. Quarrying and clay mining are important economic activities.



According to the 2014 local authority budget for Lahj, grants and central subsidies constituted 98% of the total revenue for the governorate, while local revenues accounted for only 2%. The most significant sources of local revenue were local shared revenues, income from the sale of goods and services, fines and penalties, leasing land, and selling quarries. These local revenues were negatively affected by the war, and the governorate faced major economic disruption as the site of an active front in the conflict, especially in 2015.

The poverty rate in Lahj was 69% in 2014. With the economic disruptions brought on by the war, this rate has likely increased over the past years.

The reasons behind selecting Sesame Crop to study and assess its value chain:

- The sesame crop is considered one of the cash crops in Yemen, particularly in the south (Lahj & Abyan governorates), and recently shows a high demand on it which encourages many of farmers to grow it widely and has potential to expand its growing if we could develop, upgrade, and improve the performance of its value chain.
- There is a huge demand on the sesame as seeds or its by-products: sesame meal/cake after extracting the oil from the seeds that used for fattening the livestock, and this demand came out because of society awareness about the benefits of sesame seeds or its by-products, besides the manufacturing uses of sesame oil and seeds in many manufactured products like: sesame Taheaneyah ,drugs, and cosmetics, ... etc. as an added values which open a promising horizons to shift this commodity into new manufactured products that Yemen can compete in the local, regional, and international markets.
- There is a high-quality local sesame seeds that competes excellently the imported sesame seeds.
- This cash crop provides the “Market-Based Solutions” to all the value chain’s actors/players.
- This cash crop provides many employment opportunities.



- Micro-Finance Institutions (MFIs) can invest and improve the sesame value chain through empowering the actors/players with integrated financial solutions to expand, upgrade, and improve their positionings along the chain.
- The local market covers the supply gap by importing the sesame grains from Ethiopia and Sudan, so, we can study this external route and how we can put the necessary policy on decreasing importing the external sesame seeds to make a room for Yemeni local sesame to be vastly grown, expanded and widely covers local market's needs
- Study and assess through SWOT analysis all the sesame value chain's actors who have mainly impact on the sesame value chain.
- Study and assess the market linkages, market shares, governance of the sesame value chain's actors/players and how to sustain: Trust, Transparency, and Equity among them.

The reasons behind selecting Lahj & Abyan governorates to be targeted by the sesame value chain assessment:

- They both are considered ones of the main governorates produce sesame in a big volume.
- They have delta Abyan & delta Tuban (Lahj) that are irrigated by the valley of Tuban & valley of Bana which also provide very close level of surface water to irrigate the sesame fields without any cost required for irrigating like as irrigating by wells that requires spending a lot of money on fuels or solar systems to irrigate the crop.
- The environmental and biological conditions in both governorates are suitable and optimal to grow sesame crop.
- The farmers in both governorates are skillful in growing such as crop for decades ago.
- Closeness of the local market (wholesalers, sesame oil extractors, retailers, and consumers) in Aden to both governorates.

Definition of Value Chain Management

Value chain means a group of actors/players working together to satisfy market demands. It involves a chain of activities that are associated with adding value to a product through the production and distribution processes of each activity (Schmitz, 2005). An organization's competitive advantage is based on their product's value chain. The goal of the actor/player is to deliver maximum value to the end user for the least possible total cost to the actor/player, thereby maximizing profit (Porter, 1985). A value chain is the full range of activities required to bring a product from conception, through the different phases of production and transformation. A value chain is made up of a series of actors (or stakeholders) from input suppliers, producers and processors, wholesalers, and retailers to exporters and buyers engaged in the



activities required to bring agricultural product from its conception to its end use (Kaplinsky and Morris, 2001). Bammann (2007) identified three important levels of value chain.

Value chain actors: The chain of actors who directly deal with the products, i.e. produce, process, trade and own them.

Value chain supporters: The services provided by various actors who never directly deal with the product, but whose services add value to the product.

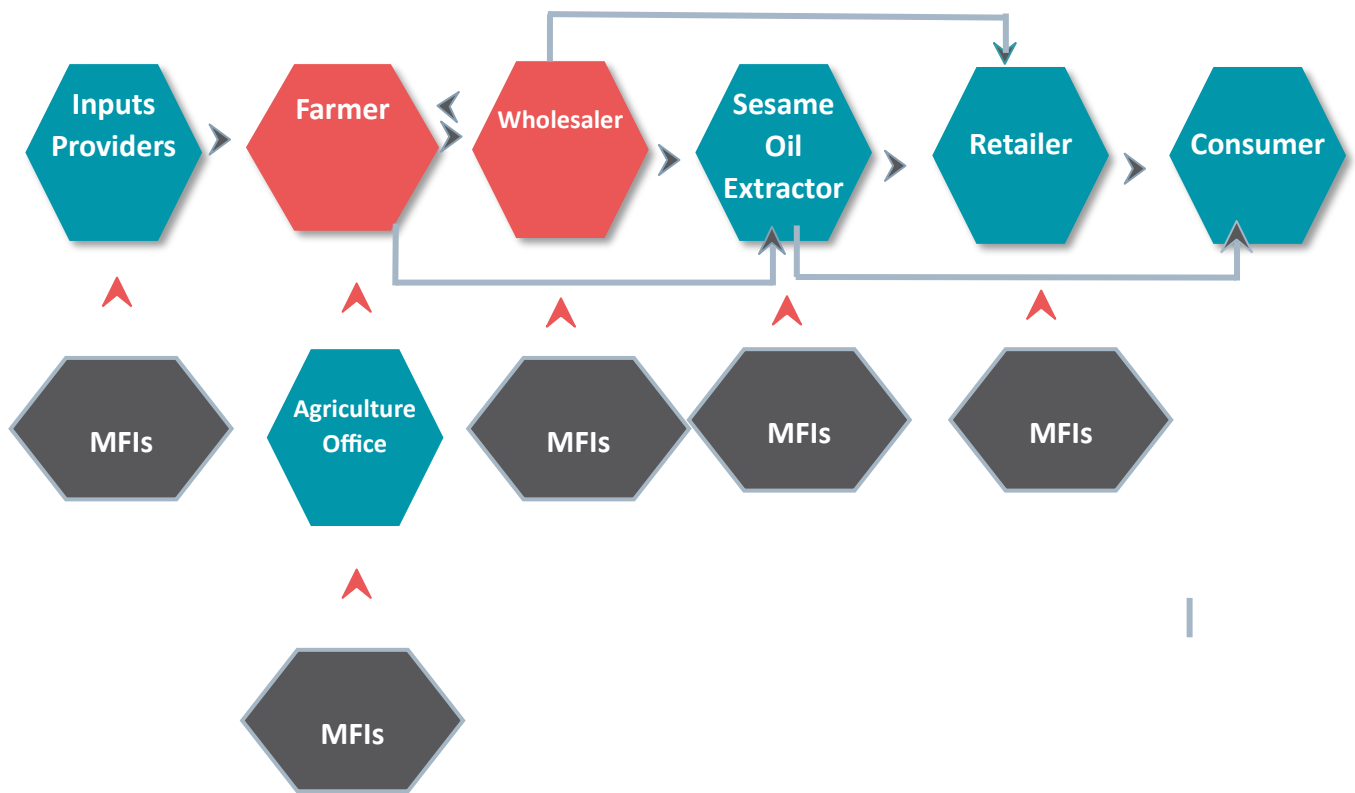
Value chain influencers: The regulatory framework, policies, infrastructures, etc.

The sesame value chain concept entails the addition of value as the sesame progresses from input suppliers to producers and consumers. A value chain, therefore, incorporates productive transformation and value addition at each stage of the value chain. At each stage in the value chain, the sesame changes hands through chain actors, transaction costs are incurred, and generally, some form of value is added. Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing.

Sesame value chains encompass a set of interdependent organizations, and associated institutions, resources, actors and activities involved in input supply, production, processing, and distribution of a commodity. In other words, a sesame value chain can be viewed as a set of actors and activities, and organizations and the rules governing those activities. Sesame value chain management is about creating the benefit at each link in the chain and a sustainable competitive advantage for the businesses in the chain. How value is actually created is a major concern for most businesses. Porter (1985) indicates that value can be created by differentiation along every step of the value chain, through activities resulting in products and services that lower buyers' costs or raise buyers' performance. It examines the performance of each economic agent at each stage of the chain rather than concentrating on just one level of activity. The analysis helps to determine the competitive advantage of actors in the entire sesame chain. This makes the analysis systemic and comprehensive by covering the entire gamut of activities involved and the corresponding types of governance involved.



Figure 2: Current Sesame Value Chain Map



The Horizontal Chain Actors/Player:

1. Inputs Provider:

There are direct inputs providers represented by the owners of shops that sell pesticides, fertilizers, irrigation systems' tools and equipment, seeds, and farming stuff who are very few in Abyan & Lahj compared to huge number of farmers in these 2 governorates, and this reveals to closeness of Aden governorate and the 2nd Capital of Yemen in the south where most of the agricultural companies are operated from there.

They seemed to be old-fashioned and rigid without looking forward to improving their business and market linkages.

They don't provide the agricultural tools like as: Hoe, Shivel, Pickaxe, Mattock, ... etc. because they are requested by the farmers as per the feedback of agricultural inputs provider.



Their market linkages in average are 10 farmers out of 200 farmers (market share: 5%), that reveal that they have consistent farmers they deal with them for a long time (for 4- 20 years) but the other farmers have relation with Aden agricultural companies/shops when they market their products to Aden.

The 10 farmers got the agricultural inputs as a debt for 1-2 seasons when they pay their debts after they sell their yields, because farmers don't have a liquidity to purchase the agricultural inputs by cash, that indicates to learn the farmers how to calculate their production costs, revenues, profits, and net profits besides also the loses and waste through financial literacy sessions.

The agricultural inputs providers took 10% as profit margins from each input.

They plan to upgrade their business by purchasing N:P:K fertilizers and some of pesticides.

They also agree to provide some/all the agricultural inputs to the farmers if the farmer is guaranteed by a wholesaler/company/MFI, and this module will enhance and improve the value chain performance.

Some of the agricultural inputs providers don't like to deal with MFIs as they think they are dealing with "Interest" which is prohibited by Islam, so, the MFIs must work hard to provide the necessary awareness about their businesses.

They also confirmed that they don't need to train their staff as they are trained well.

Weaknesses: they see that they don't have any weaknesses.

Strengths: they have excellent demanded products.

Opportunities: they look forward to support of development project funded by INGOs or NGOs for the farmers to enable them to purchase the agricultural inputs.

Threats: declined markets.

Recommendations: support farmers with solar systems. Need to modern devices or technologies to improve their businesses: they don't need it.

SWOT Analysis:

- **Strengths**

- Despite the current crisis and conflict, farmers in Lahj and Abyan shows extra shot in taking care of their farming as their main livelihood.
- They have the best quality of fertilizers, pesticides, and farming stuff for sesame farmers.

- **Weaknesses**

- The marketing of the agricultural inputs providers is very weak, and they need to reach many farmers as many as they can.
- Their business needs to special capacity building in terms of: best sales, marketing, market-based consultancy, and finance.

- **Opportunities**

- The activity of INGOs & NGOs in supporting sesame farmers brings a lot of opportunities to link with many farmers.
- The MFIs have now existed to support farmers, associations, and cooperatives to expand sesame farming and buying the agricultural inputs.
- Encouraging farmers to expand in their sesame farming will bring them a huge opportunity to expand their businesses.



- **Threats**

- Climate change may affect the sesame farming negatively that means affect their businesses also.
- Dumping the local markets with the imported cheap sesame grains affect farmers negatively and directly and agricultural inputs providers indirectly.
- Inflation and fluctuation of the national currency.
- Decreasing of purchasing power.
- Depression of local sesame seeds in the local market will reflect indirectly on them as well.

2. Farmer:

The ownership of the property of agricultural land from 6 – 40 acres.

The sharing lands are from 2 – 40 acres, and that means that farmers don't depend on their own lands, but also they try to maximize their investment into sharing another lands which this practice is a way for food security for each farmer and his family, besides maintain their livelihoods toward better future on micro, meso, and macro level, and from this point, the government and development INGOs and NGOs to encourage farmers to invest and expand their works in unfarmed lands to make it farmable.

There is not any unfarmed land, and all the farmers' land are farmed/grown.

The sesame farmed lands are from 08% - 33% from the whole lands farmed, with 20% in average for the area farmed by sesame which indicates to consider this as an important cash crop.

Sesame farmed variety is called "Black" or Black Baladi which is grown at Lahj and Abyan for a long time 20 – 40 years, most of farmers said they don't need to another hybrid or better seeds of sesame, and few of them said they would like to try better sesame seeds.

There are 3 seasons for sesame: (Early: July-August-September), (Middle: October-November-December), (Late: January-February-March), but the middle season is considered as the best season in the year which depends on the yearly valley stream whereas the farmers don't afford the irrigation costs which reflected as profits, moreover, the water surface which enable farmers to multiply number of sesame season in the year into 3 seasons, one basic (the middle), and two seasons can be irrigated by the water surface which its depth is 30-40 meters, and this gives Yemen especially Lahj & Abyan governorates a great opportunity to expand this cash crop and gets the tremendous benefits for the sesame farmers and national sesame production which can cover the supply gap and high demand of local sesame in Yemen and combat importing the external sesame seeds. The government, INGOs, and NGOs can mobilize sesame farming through the 3 seasons and encourage the farmers to expand their sesame farming as much as they can to cover the national demand and go beyond to export Yemeni sesame.

Labor in Sesame Farming:

There are 3 laborers (men) for sowing the seeds, irrigating the crop and controlling the pest and diseases by spraying the pesticides and adding the fertilizers, and 15 laborers (women) for sesame harvesting, the



work day starts from 06:00 A.M. and finishes in 06:00 P.M., most of the laborers come from the same villages, and the family laborers are not familiar except one farmer who stated that there 3 family laborers works in their sesame fields. Their workday rate varies, 4,000YER for woman, 8,000YER for man, the payment paid in each day for women, but the men received their entitlements in each month. The farmers confirmed that there are about 7 consistent laborers, and the rest of laborers are changeable depending on their desire and acceptance to work. The skillful laborer varies from 3 – 10, the unskillful laborers also varies from 2 – 15. The number of women that works in sesame lands 4 – 10 with age varies from 20 – 40-year-old.

Table 3: Sesame Farming Production Costs

#	Activity	Cost Calculation	Final Cost	Upgrading
1	Land tillage and preparation: (by tractor for 10 acres).	15 hours * 37,000YER	555,000YER	Farmers can reduce tillage and preparation their land by establishment Producer Association which can buy a tractor which will be used economically by all the PA members.
2	Manure: from the village.	200,000YER	200,000YER	PA can invest in fermenting manure and sold decent prices to the members.
3	Fertilizers: he doesn't use it for this crop.	0YER	0YER	
4	Pesticides: he doesn't use it for this crop.	0YER	0YER	
5	Weeding: he doesn't use it for this crop.	0YER	0YER	
6	Irrigation Laborer:	3 times * 10,000YER * 6 laborers	180,000YER	PA can offer this employment opportunities to PA poor members.
7	Farming:	15,000YER * 3 laborers	45,000YER	PA can offer this employment opportunities to PA poor members.
8	Harvesting:	4,000YER * 4 days * 15 laborers	240,000YER	PA can offer this employment opportunities to PA poor members.
9	Irrigation: they have solar pumps	0YER	0YER	
10	Transportation of Inputs	35,000YER	35,000YER	PA can invest in providing transportation service to their members in decent prices and in profitable prices for non-members. PA can get the vehicles through MFIs.
11	Transportation of yields	40,000YER	40,000YER	PA can invest in providing transportation service to their members in decent prices and in profitable prices for non-members. PA can get the vehicles through MFIs.
12	Zakat	50,000YER	50,000YER	
13	Marketing Costs	0YER	0YER	
14	Tax	0YER	0YER	
Total			1,345,000 YER	



50% of the farmers pay the costs of agricultural inputs cash and 50% of them pay in the end of the season after selling their yields.

1 acre needs 2.5 kilos of sesame seeds (3,600YER/kilo) to plant it, and 1 acre produces 1.5 bag 50 kilo (2.5 kilo (3,600YER/kilo = 9,000YER) give 75 kilos of sesame seeds (4,000 * 75 = 300,000YER).

The expected revenue/profits margins of 10 acres = 10 * 300,000YER = 3,000,000YER – 1,345,000 = 1,655,000YER, the profit % = 123%.

The acre produces sesame seeds in the last three years as follows:

Table 4: Sesame Productivity in Last 3 Years

#	Year	Productivity/Acre (Bags & Kilos)
1	2023	1.5- 2 bags = 75- 100 kilos
2	2022	1.5 bags = 75 kilos
3	2021	1.2 bags = 60 kilos

The increased productivity/acre resulted by the agricultural best practices: good fertilizing and pest and diseases control which farmers attributed that to those best practices besides the good quality of sesame seeds they planted, and the excellent fertility of soil enriched by the good nutritional elements come with the floods/valley streams.

The farmers got the characteristics of sesame seeds on their perceived information: black and big seeds, which they purchased from the wholesalers.

The farmers prefer to sell their whole yields and then purchase their farming seeds from the wholesalers to get the best seeds, this means that farmers don't prefer to store their farming seeds for the next season but rather to buy it from the wholesalers.

The farmers said they sold their yields through the following price in the last 3 years:

Table 5: Sesame Price (YER/Kilo)

#	Year	Price (YER/Kilo)
1	2023	3,000
2	2022	2,500
3	2021	2,000

We see that the price gets raised by 20% in each year from 2021 to 2023 which reveals that the demand for Yemeni local sesame is getting high despite the current economic crisis in Yemen.

The farmers in Abyan sell their sesame seeds to: Mr. Ben Flees – Wholesaler – phone number: 775730635 because he is so close to them and give the best price. While the farmers in Lahj sell their sesame seeds to many traders in Aen city: Mr. Ahmed Al-Wosabi, Mr. Jalal Al-Barakani, and some of sesame oil extractors because they are close to them and give also the best price.

The business relationship between the farmers and wholesalers is 6 – 25 years, and some of them prefer to stay in dealing with the wholesaler like as Mr. Ben Flees rather than to sell to another one, while most of them declared they will sell their yield to whoever give them the best price with/without contractual agreements.



The profit margins of each farmer vary from 1,000,000 to 3,000,000YER in each season as per the number of acres they farmed, yields, and price of each kilo, it seemed that there was a slight difference in the revenues in each year, but it seemed toward a higher and steady upwards which is really promising to this value chain and commodity.

The Training: farmers confirmed that they don't need any capacity building regarding agricultural best practices of sesame farming, except one farmer, and they did not receive any training from any local NGO or INGO, which draw out attention to mark this as a big opportunity to support and help farmers in terms of providing the needful capacity building.

Financial and Loans Services: 60% of the surveyed farmers confirms they would apply for getting financial and loans services from the MFIs (around 2,000,00YER) to increase their production, while 40% confirmed they would not apply for that because they see it as "Reba" which is prohibited in Islam. The close MFIs are Al-Kuraimi Islamic Bank, Yemen Women Alliance, and some of MFIs.

Association Engaging: 40% of the surveyed farmers declared that they are members in 2 associations: Abr Al-Meqshabah & Al-Mehdarah Association, and Wadi La'atam Cooperative, while 60% of them they are not registered in any association. This presents the importance of engaging the farmers into the associations or cooperatives effectively and efficiently to benefit of the services package for its members which they have a competitive and comparative advantage than unregistered farmers.

SWOT Analysis:

- **Strengths:**

- Farmers have large areas that are cultivatable.
- Farmers have willingness to grow sesame crops in those cultivatable areas.
- Sesame farming is not hard (comfortable) compared to other crops, doesn't cost much money, has good and promising demand in the local market, produced in high quality, quick production, and has best revenues.

- **Weaknesses:**

- The pest and diseases that weakens the productivity of sesame crop and increases the control cost.
- High production costs that yearly getting high and reduces the revenues.
- The floods and valleys streams are recently weak due to decline of rainfall at the mountainous areas.
- Lack to liquidity to pay the tillage costs and other farming activities which makes it difficult to farmers to expand or farm more cultivatable areas.

- **Opportunities:**

- Potential high floods and valleys streams.
- The factories of Sesame Halawah (Taheenyah) might be introduced to the farmers and linked with them which could bring potential to expand of sesame crops and increase the sesame production and strengthen this sub-sector and maintain the farmers' livelihoods and incomes.
- The MFIs have now existed to support farmers, associations, and cooperatives to expand sesame farming and buying the agricultural inputs.



- Encouraging farmers to expand in their sesame farming will bring them a huge opportunity to expand their profits margins.
- Establishment new Sesame Producers Associations at Abyan and Lahj governorates would add a tremendous value and impact on the farmers by organizing them institutionally and technically to face any challenges with strong entities.
- Farmers don't pay any taxes for the government which is indeed an opportunity to converted into profits for the good of farmers.

- **Threats:**

- The current crisis may affect the overall economy which leads to lack to liquidity in farmers' hands to run their farming process.
- Climate change may affect the sesame farming negatively that means affect their businesses also.
- Dumping the local markets with the imported cheap sesame grains affect farmers negatively and directly and agricultural inputs providers indirectly.
- Inflation and fluctuation of the national currency.
- Decreasing of purchasing power.
- Depression of local sesame seeds in the local market will reflect indirectly on them as well.

The Training: farmers declared that they need a technical training especially when there are new pests or diseases, they don't know how to control the.

Technologies: the farmers said that they need solar pumping systems, drip irrigation systems, water tanks, sparing motors

3. Wholesaler:

The profile of business of the wholesaler is trading in cereals seeds and vegetable seeds included sesame seeds, and some of them is trading in pesticides and fertilizers.

Their specialization in provision of sesame seeds is 100% besides other cereals and vegetables seeds since 1980 – till now, and some from 1990 and 2000 till now.

Number of laborers: 05 – 20 persons distributed in the main shop and stores of seeds/goods.

The whole purchased volume of sesame by the wholesaler varies from 600 tons – 15 tons yearly. They buy it from

- Wadi Kabeer & Wadi Sagheer – Lahj governorate.
- Al-Habeel – Al-Mansourah- Lahj governorate.
- Batais – Al-Jabalain – Abyan governorate.

The wholesalers of Lahj governorate receive the sesame seeds from farmers who bring it to them while the wholesaler from Abyan sometimes farmers bring the sesame seeds to him and sometimes, he goes to the farmers and buy the sesame from the.

The sesame trade represented 25%- 50% to the wholesalers compared to other cereals and seeds trade. The years of specialization in sesame trade is long in Lahj (20 – 72 years) and longer than Abyan (12 – 30 years).

The specifications of buying sesame from the farmers are:

- The big and black seeds of sesame because it gives an oil and very preferable for farming (Lahj governorate).



- Al-Kawd 94 (big and black sesame seeds) (Abyan governorate).
- The lower and lighter colors of sesame seeds are purchased in lower prices from black to white accordingly.

Number of farmers who the wholesalers buy from them: 30 – 200 farmers at Lahj, and less than 1,000 farmers at Abyan.

The wholesalers confirmed that the farmers supply them with the local market's needs of sesame seeds, and the high demand for sesame seeds from wholesalers happens when:

- High prices of the imported sesame prices.
- Rising of exchange rates.
- Seasons of exporting the external sesame seeds.
- When the farmers sell their sesame seeds directly to the sesame extracting shops.

Sesame Quality with related prices and profit margins for the farmers:

Table 6: Quality Grades of Purchased Sesame Seeds, Price, and Profit Margins for Farmers

#	Quality % of Sesame Seeds Purchased from Farmers	Quality Degree	Price for 1 Kilo (YER)	Profit Margin / Kilo (YER) for Farmers
1	85% - 90%	Excellent	3,000 – 4,000	1,500 – 2,000
2	5% - 10%	Premium	1,500 – 2,000	750
3	5%	Poor	700	350

From the table above, the wholesalers purchase the high % of sesame seeds from the farmers, and give the farmers 50% of profit margins to encourage them to provide this quality with big volumes, on the other hand, the farmers are so keen to provide the high quality of sesame seeds, and they also sell the 2nd and 3rd grade of quality of sesame seeds. The information flow on the high quality of sesame seeds is fully aware and understood by the farmers from the wholesalers.

It's noteworthy that the wholesalers sell their sesame seeds (the whole quantity purchased) to the farmers before the sesame farming season (40 years on this model) besides selling it to the shops of sesame oil extracting (20 years on this model) and some sell it to other governorates: Hadhramaut, Shabwah, Aden, and Taiz, and some wholesalers said that they sell to the retailers (supermarkets) (10%), and they said they did not sell their sesame seeds to any factories because they demand a huge amount with lower prices, so, they purchased the external (not local) sesame.

The wholesalers confirmed that they only purchase the sesame seeds from the farmers, that means that their commercial linkages is long and characteristic with trust, equity and transparent.

Table 7: Quality Grades of Purchased Sesame Seeds, Price, and Profit Margins for Wholesalers

#	Quality % of Sesame Seeds Purchased from Farmers	Quality Degree	Price for 1 Kilo (YER)	Profit Margin / Kilo (YER) for Wholesaler
1	85%	Excellent	5,000 – 6,000	1,000 – 2,000
2	10%	Premium	3,000	1,500
3	5%	Poor	2,500	1,000

We found that the wholesaler's profit margins 30% for the vast quantity of excellent sesame seeds, the same of the farmer, with higher 50% for the premium and poor sesame seeds

The wholesaler confirmed that they sell the whole quantity of sesame seeds they purchased, and rarely remains in the store when the demand was low.

The values every wholesaler adds to the sesame seeds are:



- Cleaning: from the defects, leaves, duct, soil, and sticks by hands or fans
- Sorting: into excellent (black), premium (brown), and poor (white) seeds which packed into its bags with remarks on each bag.

80% of the wholesalers receive their money of sold sesame seeds in cash, while 20% receive it after 1 – 2 months.

The wholesalers pay to farmers value of their purchased sesame seeds in cash 100% mostly, but sometimes they postpone the payments if the market demand is weak.

The wholesalers said that they can either give cash to the farmers or guarantee them to the agricultural inputs providers/shops or to the MFIs to get what they need (seeds, fertilizers, pesticides, tools, equipment, and solar systems) to farm their sesame crops well with their yields guarantee when they harvest it.

The wholesalers said that they need a special training “Accounting” and “Agricultural best practices of sesame,” while some don’t need any training as they have already trained their staff and workers.

Regarding the technologies the wholesalers need, they said, they need electronic scales of 100 kg, while other said they don’t any advanced tools or equipment as they have all what they their business need.

SWOT Analysis:

- **Strengths:**

- high prices of sesame are encouraging due to high demand locally.
- The half of sesame farmers in Abyan don’t pay any penny in irrigating their fields, which encourage other farmers to grow more fields with sesame, also the floods and high % of rainfall participate in this a lot.
- The war in Sudan may cause the shortage of import of sesame which played in high demand for the local sesame.
- It may that the Yemenis become more aware of benefits of sesame grains, which played to high demand locally for the local sesame.

- **Weaknesses:**

- Shortage of liquidity during high demand (to pay for farmers or purchasing the sesame seeds) causes loss good opportunities.
- The imported sesame quantities are double than the local produced sesame although the high demand for the local sesame.

- **Opportunities:**

- There is potential to encourage farmers to expand sesame farming by taking advantage of ongoing steams of valleys and sesame prices.
- The MFIs have now existed to support farmers, associations and cooperatives to expand sesame farming by proving solar systems and other farming requirements.
- The factories can involve in this sector and encourage the farmers to expand their sesame farming to compete the imported sesame.
- The government and agriculture offices can invest in building dams and irrigations canals which help in irrigating farmers’ fields.



- Increase the awareness of sesame benefits among the Yemenis by implementing promotion activities for this promising cash crop.

- **Threats:**

- Climate change may effect of scarcity of floods and streams of valleys that would affect the sesame farming negatively.
- Dumping the local markets with the imported cheap sesame grains.
- Inflation and fluctuation of the national currency.
- Decreasing of purchasing power.

4. Sesame Oil Extractor:

The surveyed sesame oil extractors in Aden are from outside of Aden and south governorates, while they are from the same governorates in Lahj and Abyan.

Their business specialization period exceeded 25 years to 60 years, so they are very specialized in their business 100%.

The sesame oil extractors' education is from 6th – 9th class.

Number of workers: 2 – 7.

Each sesame oil extractor produces: 50% sesame oil & 50% sesame cake/meal.

The purchased quantities of sesame seeds in each season: 70 – 100 bags (50 kg bag) = 3.5 – 5 tons.

They purchase sesame seeds from: Abyan 40%, Lahj 30%, and Al-Hodaidah 30%.

The farmers bring the sesame seeds to the sesame seeds extracting shops, because they shops' owner think if they go to the farmers would cost them extra money for the transportation.

The business of extracting oil from the sesame seeds represents 100%.





The qualities of sesame seeds purchased:

- Local: especially from Abyan governorate which has a special taste.
- Black.
- Clean and pure without any defects.
- Big grains/seeds.

They purchase sesame seeds from:

- 3 farmers and traders from Abyan governorate.
- 4 farmers and traders from Lahj governorate.
- 5 farmers and traders from Al-Hodaidah governorate.

The farmers and traders only cover 3 months of the year (200 Faraslah = 200 * 12.5 kg = 2,500 kg = 2.5 tons), while they sesame oil extracting shops depend on the external sesame (200 Faraslah = 200 * 12.5 kg = 2,500 kg = 2.5 tons) for the 9 months of the year.

The evaluation of quality of sesame seeds supplied by the farmers and wholesalers to the sesame oil extracting shops as follows:

Table 8: Quality Grades of Purchased Sesame Seeds, Price, and Profit Margins for Farmers

#	Quality % of Sesame Seeds Purchased from Farmers	Quality Degree	Price for 1 Kilo (YER) (SouthYemen)	Profit Margin / Kilo (YER) for Farmers	Profit Margin % / Kilo (YER) for Farmers
1	70%	Excellent	3,632	363	10%
2	20%	Premium	3,178	318	10%
3	10%	Poor	2,951	295	10%

From the above table, we noted that farmers got profits margins if they sell their sesame seeds to the wholesaler better than if they sell it to the sesame oil extractors. The same thing, for the wholesaler's profits margins are high if they sell the sesame seeds to the farmers or other known sesame oil extractors.

The sesame oil extractors provide the information and qualities of the sesame seeds to the farmers and wholesalers and other providers.

The sesame oil extractors buy from:

- Wholesalers (75%)
- Retailers (10%)
- Collectors (15%)

The sesame oil extractors extract all what they have 100% of the sesame seeds, they don't store any quantity.

The sesame oil extractors extract 1.5 – 2 bags on daily basis

**Table 9: Quality Grades of Purchased Sesame Seeds, Price, and Profit Margins for Extractor**

#	Quality % of Sesame Seeds Extracted (15 liters / day)	Quality Degree	Price for 1 Liter (YER) (South Yemen)	Profit Margin / Liter (YER) for Extractor	Profit Margin % / Liter for the Extractor
1	30%	Excellent	8,000- 9,000	500 – 1,000	11%
2	70%	Premium	7,000	500 – 1,000	14%

From the table above, we found that the sesame oil extractors have 11%- 14% profits margins, and they told us that they are struggling in this business despite the low profit margins, but they befitted also from selling the sesame cake/meal after extracting the oil from the sesame seeds with 14,000YER for 40 kg bag, so, the price of 1 kilo of sesame cake/meal is 350YER which make the profits margins jump a little bit to 15% - 19%, but the sales of sesame cake/meal and sesame oil in big quantities plays a good part in accumulated profits margins that support the consistency of the business especially when they sell the local sesame oil from the local sesame seeds rather than from the external one which plays a good role in wholesale sales.

There are around 70 sesame oil extracting shops in Aden only, that means that there are around 70 Micro Enterprises need to be developed and supported in terms of production, operations, and marketing. A bag 50 kg produce 23 liters of sesame oil and 27 kilos of sesame cake/meal.

The added value the sesame oil extractor adds is:

- Cleaning the sesame seeds from the defects.
- Extraction process.
- Packaging in plastic packs.
- Labelling the oil plastic packs with the shop's label with related information.

The added-value costs (shop rent, electricity and water charges, workers' fees, cost of equipment and tools, plastic packs, taxes, Zakat) = around 4,000YER/liter of sesame oil sold.

The extractors get 70% cash and 30% postponed (1 – 1.5 month, and sometimes to a year) from the retailers, wholesalers and consumers.

The extractors pay the cost of purchased sesame seeds from the farmers or the wholesalers cash (50%) and postponed (50%) and released every week for 2 months, and some extractors pay 100% cash.

Some extractors in Aden showed their willingness to guarantee any farmer buy their agricultural inputs with any trader, and also to guarantee them with the MFIs, while some of extractors in Abyan refused to do so,, the same situation with their desire to deal the MFIs to get loans to expand their businesses, the ones from Aden were positive, while the ones from Abyan refused to do so.

Regarding the training for their staff/workers, they need to special training in the accounting and sales management as they are working traditionally to run their businesses.



SWOT Analysis

- **Strengths:**

- The high demand for sesame oil and sesame cake/meal along the year without any stops.
- They are passionate and love their working in this business.
- The farmers recently expanded in sesame farming in Lahj and Abyan and Hodaidah which helped them to produce the sesame oil from the local sesame seeds.

- **Weaknesses:**

- There is still gap in local sesame supply which they covered with the external sesame.
- The high charges of fuels and electricity and other business' requirements that raise the production costs and low the profits margins.

- **Opportunities:**

- The customers show a strong desire to buy the sesame oil due to the cultural wave among them about the benefits of sesame oil.
- The MFIs are now existed to support them to expand sesame oil extracting by proving solar systems and other business requirements.
- Increase in demanding of the sesame cake/meal for fattening their calves and oxen and for cows to increase milk production.

- **Threats:**

- Dumping the local markets with the imported cheap sesame grains.
- Inflation and fluctuation of the national currency.
- Decreasing of purchasing power.

They suggested to have loans to get solar systems to run the extraction machines in addition to cash to buy the sesame seeds during the season and they can return it in installments.

They show no desire to get any advanced technologies that can support and improve their business.

5. Retailer:

The retailers in Lahj and Abyan are few and less specialized, as they are working in selling many products besides sesame seeds/grains. Specialization in sesame seeds is during 5% and for 3 – 5 years.

The quality of purchased sesame seeds is: black, which is similar to farmer, wholesaler's feedback on this subject. They purchase the sesame seeds only from around 10 – 15 farmers from 3 – 4 villages in Abyan and Lahj governorate.

The retailers said that the farmers sometimes cover their market's needs, and sometimes not due to low yields in some years. The retailers said that they purchase the high quality sesame seeds with price 4,000 YER/kilo, with profit margin 1,000 YER/kilo for the farmer.

The retailers sell the high-quality sesame seeds to sesame oil extracting shops & customers with price 6,000 YER/kilo, with profit margin 1,000 YER/kilo for the retailer.

the retailer's sales around 0.5 – 1 ton a year. The retailers get their sales' cash (50%), and the other 50% at the end of each month until they fulfill the whole payment.



The retailers also pay 50% cash to the farmers and postpone 50% to some of weeks.

The retailers said also they can provide cash to any farmer to buy his agricultural inputs for sesame farming season with guarantee of farmer's production that will sell to the retailer.

The retailers said also they can guarantee any farmer in front of any MFI to buy his agricultural inputs for sesame farming season with guarantee of farmer's production that will sell to the retailer.

The retailers also said they agree to get Islamic loans from any MFI to expand and improve their businesses. Regarding the training, they said they don't need any training to improve their business.

SWOT Analysis

- **Strengths:**

- The high demand for sesame seeds along the year without any stops.
- The farmers recently expanded in sesame farming in Lahj and Abyan.
- Their main supplier are the farmers, so, the quality of sesame seeds is high compared to the external sesame seeds.

- **Weaknesses:**

- They are still working traditionally in terms of accounting, marketing, and sales.

- **Opportunities**

- There is high demand for sesame seeds from the sesame oil extraction shops and consumers.
- The MFIs now existed to support them to expand sesame oil extracting by proving solar systems and other business requirements.

- **Threats:**

- Non-compliance of some farmers with selling their crop to the retailers due to the absence of contractual agreements.
- Dumping the local markets with the imported cheap sesame grains.
- Inflation and fluctuation of the national currency.
- Decreasing of purchasing power.

The retailers said they suggest supporting farmers to produce more local high quality sesame seeds.

Regarding the technological assets they need, they said: they need to electronic program of accounting, this opens a good opportunity to the software companies specialized in accounting to provide and upgrade the accounting capacities of the retailers.

The Vertical Chain Actors/Players (Chain Supporters):

6. Agriculture Office:

The following sesame varieties are dominated grown by the farmers:

- The local red variety 30% - 40%.
- Kawi 94 variety 60%.
- The white variety 1%.



The main suppliers of sesame seeds are the wholesalers.

Sesame farming dominated grown at DeltaTuban districts of Lahj governorate and Delta Abyan districts of Abyan governorate which compose 80% of sesame farming in the 2 governorates which dependently irrigate their fields from Bana valleys streams.

There are 35 extensionists in Lahj governorate with 50% efficiency, while there are 32 extensionists in Abyan governorate who faces difficulties to get transportation to visit the fields of farmers.

The main sesame farming season starts from July – August – September, and the middle season is: October – November – December.

The irrigation methods of sesame crop are: 70%- 85% by valleys stream, and 15%- 30% by the wells.

The extensionists provide free extension services to the farmers, as they live nearby them, and sometimes farmers bear the cost of movement of the extensionist to the farmer's field to diagnose the diseases or pests at the field and provide the necessary advice to solve those problems.

The farmers consult the governmental and freelance extensionists to solve their problems at their fields.

The acre yield of sesame crop is around 300 – 500 kilos.

The agriculture office managers recommend increasing the productivity of the 1 m2 to:

- Activate the role of agricultural extension through implementing demo plots.
- Rehabilitate and train the extensionists.
- Rehabilitate the irrigation canals of delta Abyan and deltaTuban.

The pests and diseases of sesame crop are: Osal (Aphids insects), Al-Tasamogh (fungal disease), roots rotten diseases (fungal diseases), and sesame pods moth (insect).

The agricultural treatments for those pests and diseases are:

- Choice the best sesame season to grow.
- Take care of implementing the agricultural best practices.
- Collect the worms of the moth insect from the plants.

The sesame in Abyan governorate witnesses an expanding of the sesame farming due to the high demand on Abyan sesame seeds (2 – 3 times a year), while in Lahj governorate witnesses a stable farming because the farmers prefer to grow cereals (valleys stream irrigation), while prefer vegetable farming by wells irrigations, and the sesame farming comes the 3rd rank if the farmer has extra space of the field.

The officials of agriculture offices said that to activate the extension role by:

- Provision an operation budget for the technical office.
- Train and rehabilitate the extensionists.
- Implement regular demo plots before, within and after the sesame farming seasons.

There is no agricultural cooperative or association in Lahj governorate, but there are 2 agricultural cooperatives in Abyan governorate:

- Al-Rawa agricultural cooperative.
- Al-Dergag agricultural cooperative.

Without any capital and is ineffective and need to be activated.

The officials of the agriculture offices said that the "Demand & Supply" Law governs the sesame seeds local markets, and the following actors contribute to do so:

- Wholesalers 50%.
- Sesame Oil Extractors 30%.
- Farmer 20%.



They need training in Value Chain Analysis & Development and Climate Change and its effects on the agriculture sector.

SWOT Analysis

- **Strengths:**
 - The agricultural cadre is available in different agricultural specializations.
 - The good relations and coordination between agriculture offices and local NGOs and INGOs.
 - There is a radio broadcasting 10 – 15 minutes in Abyan called “Al-Ardh Al-Tayyebah” to discuss the agricultural and livestock issues.
 - There is a good relationship between farmers and agriculture offices.
 - **Weaknesses:**
 - There is no operations budget especially with the current conflict and crisis.
 - There is no transportation budget to conduct field visits to the farmers.
 - **Opportunities:**
 - There is high demand for sesame seeds from the local market and sesame value chain actors.
 - The MFIs now existed to support them to expand sesame oil extracting by proving solar systems and other business requirements.
 - The drip irrigation systems offer good climate smart technology to deal with climate changes.
 - Using fertilizers benefit the farmers to get high quality sesame seeds and yields.
 - **Threats:**
 - Protracting of the current conflict and crisis.
 - Dumping the local markets with the imported cheap sesame grains.
 - Inflation and fluctuation of the national currency.
- Regarding the technological assets they need, they said: they need to:
- Devices for sesame seeds diagnosis in terms of: humidity, density, oil content, and purity.
 - Laptops.
 - Solar systems for lightening and operating the devices.
 - Data show device.
 - Cameras.

Value Chain Governance:

Governance refers to the role of coordination and associated roles of identifying dynamic profitable opportunities and apportioning roles to key players (Kaplinsky and Morris, 2000). Value chains imply repetitiveness of linkage interactions. Governance ensures that interactions between actors along a value chain reflect organization, rather than randomness. The governance of value chains emanates from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in activities, roles and functions. It is important to note that governance and coordination sometimes appear as synonymous or interchangeable terms in the literature. Already in the 1980s, Williamson (1979, 1985) used the term governance to define the set of institutional arrangements in which a transaction is organized. As Giraffe’s work on Global Commodity Chains and the role of governance appeared, the term coordination took on a new meaning, basically, the vertical organization of activities. The application of contract/private ordering/governance leads naturally into the



reconceptualization of the firm not as a production function (in the science of choice tradition) but as a governance structure (Williamson, 2002). According to Raikes et al. (2000), trust-based coordination is central for goods and services, whose characteristics change frequently, making a standardized quality determination for the purposes of industrial coordination difficult. This applies to the manufacturing industry as well as agri-food chains. It is possible to identify in one industry several coordination forms used by different firms where the choices rely on the trust existent between the firms.

Value chains can be classified into two based on the governance structures: buyer-driven value chains, and producer-driven value chains (Kaplinisky and Morris, 2000). Buyer-driven chains are usually labor-intensive industries, and so more important in international development and agriculture. In such industries, buyers undertake the lead coordination activities and influence product specifications. In producer-driven value chains that are more capital intensive, key producers in the chain, usually controlling key technologies, influence product specifications and play the lead role in coordinating the various links. Some chains may involve both producer and buyer driven governance. Yet in further work (Humphrey and Schmitz, 2002; Gibbon and Ponte, 2005) it is argued that governance, in the sense of a clear dominance structure, is not necessary a constitutive element of value chains. Some value chains may exhibit no governance at all, or very thin governance. In most value chains, there may be multiple points of governance, involved in setting rules, monitoring performance and/or assisting producers. Chain governance should also be viewed in terms of 'richness' and 'reach', i.e., in terms of its depth and pervasiveness (Evans and Wurster, 2000). Richness or depth of value chain governance refers to the extent to which governance affects the core activities of individual actors in the chain. Reach or pervasiveness refers to how widely governance is applied and whether or not competing bases of power exists. In the real world, value chains may be subject to multiplicity of governance structure, often laying down conflicting rules to the poor producers (MSPA, 2010).

The dominant value chain actors play facilitation role. They determine the flow of sesame seeds and level of prices. In effect, they govern the value chain and most other chain actors subscribe to the rules set in the marketing process. The study result indicates that the farmers and wholesalers are the key value chain governors. The smallholder farmers are not organized but have a power to govern the value chain as they set the sesame price after deducting their production costs and add a light profit margins which is eventually set by agreeing the farmer and wholesaler, sesame oil extractor or the retailer on an agreed price that is satisfied by all the actors, and this is considered and varied due to each farmer, his strong negotiation power and skills, and the wholesalers, the sesame oil extractors or the retailers they deal with, which contribute to set the standard price for 1 kilo of sesame seeds, moreover, the farmers have a huge potential to be organized into Sesame Producers Associations which can support farmers to get higher prices through strategic marketing and sales. On the other hand, the wholesalers are also the value chain governors due to they have great relations with the farmers and for a long of time, and farmers really trust them, so they buy the sesame seeds from the farmers with reasonable prices and sell sesame seeds with more profitable prices to the same farmers who use it for new season, and for the sesame oil extractors, the wholesalers govern the value chain due to also their huge liquidity that enables them to borrow the farmers in advance with the season's farming requirements.



Conclusions & Recommendations for Upgrading Sesame Value Chain:

This study reveals a lot of things that we briefly conclude & recommend as follows:

- The sesame crop is a promising cash crop and has a huge potential to support Yemeni economy if it is operated well through upgrading its value chain.
- Abyan governorate is more specialized in sesame farming and producing than Lahj governorate.
- Delta Tuban & Delta Abyan are considered the richest lands/fields in the southern areas need more attention in terms of building the irrigation canals, water barriers, and re-cultivating new lands/fields to expand sesame farming in both governorates, and those activities can be done through CFW & Cash+ modules.
- The Sesame Producers Associations (SPAs) are crucial for supporting sesame farmers in both governorates to organize them into institutional entities that they can receive the technical capacity building, support SMEs, maintain gender mainstreaming, and loans and financial services, and marketing through contractual agreements with the wholesalers, sesame oil extractors, and potential factories.
- There is a potential for Sesame Halawah factories in Yemen (HSA Group) to be linked with the new established SPAs, and they can sign the contractual agreements on the quantities ordered and build the technical capacities of farmers in terms of delivering the specific quality of sesame seeds.
- Farmers need to be supported in terms of provided financial services and loans, as farmers can apply for the loans they need with guarantee of their established SPAs and their coming yields or with wholesalers and sesame oil extractors' guarantee to get whatever they need to run their sesame farming well: solar pumping systems, drip irrigation systems, tillage costs, purchasing some farming equipment: water tanks and spraying motors, and costs of expanding in cultivating new lands/fields.
- Farmers need to be linked with agriculture offices' best agronomists, so that they get the consultancy services on they face in their sesame crop of pests and diseases to quickly control it.
- The government needs to controlling importing the external sesame seeds from Sudan and Ethiopia in order to encourage the farmers to expand in sesame farming according to a strategic plan which reaches to permanently stopping of importing the external sesame seeds, and thus, increase the prices of local sesame for the seek of Yemeni local farmers, and this step is important toward Yemeni sesame seeds exporting in collaboration all the sesame value chain actors/players in the horizontal and vertical chain.
- The statistics of sesame value chain especially the actors: wholesaler, sesame oil extractors, retailers, and MFIs need to be officially registered in a trade directory or database in order to benefits from its info and contact details as reference, on the other hand, we can specify the market demands actually and then we can put and organize an accurate plan to fulfill the local market needs of local sesame seeds.
- Yemen Standardization, Quality Control, and Metrology Organization (YSMO) can play a strategic role in create a Yemeni Specification for Yemeni Sesame Seeds and its oil and cake/meal which should be align with the scope of international specification of sesame seeds, oil, and cake/meal. This will help the all the value chain actors to be complied with it and whoever violates it will be under penalties of the ministry of trade and industry and ministry of agriculture and irrigation.



- Yemeni sesame crop needs more promotional workshops and campaigns to introduce it to the Yemenis locally and website to introduce it regionally and internationally represented by The Agricultural Marketing Department in the Ministry of Agriculture and Irrigation. Those campaigns and workshops should be done on yearly basis to promote consumption of sesame seeds, sesame oil in many meals and desserts and other sesame seeds and its many uses mentioned above, in addition to how can sesame cake/meal fit be used to fattening livestock: calves, sheep, goats, cows, and camels.
- The MFIs have a great potential to build the financial capacities of the established SPAs and their farmers members, wholesalers, sesame oil extractors, and retailers regarding their financial services and loans and its terms and conditions which this step will offer a great deal to MFIs to enrich and prosper this sub-sector and then, MFIs can prosper in return.
- Business Development Services (BDS) providers can strengthen the sesame sub-sector through build the technological, technical, administrative, institutional, and financial capacities for all sesame value chain's actors/players which will improve their businesses towards more efficiency, effectiveness, and resilience (design the final product whether is sesame seeds or oil in packages and bottles with attractive labels).