Food and Agriculture Organization of the United Nations

IFC International Finance Corporation WORLD BANK GROUP

Assessment Report

Coffee value chain in Yemen

Export potential and investment opportunities

cover photograph: *Coffee tree, Yemen, October 2021, ©Mocha Valley.*

Coffee value chain in Yemen

Export potential and investment opportunities

Hadi Fathallah, Arzaq Al-Najjar, and
Jozimo Santos Rocha

Sana'a, Yemen
2023

FAO and IFC. 2023. Coffee value chain in Yemen: export potential and investment opportunities. Rome, Italy.

ISBN

Acknowledgments

This study is part of the Investment Oriented Diagnostics series prepared by the Hand-in-Hand Initiative in Yemen. The study is among the products of a joint effort between the Food and Agriculture Organization of the United Nations (FAO) and the International Finance Corporation (IFC) of the World Bank Group to better understand the growth potential of export-oriented value chains in Yemen and their investment opportunities. The work was conducted under the overall supervision of Hussein Gadain and Wafaa Khoury at FAO and Dahlia Khalifa at IFC, with the technical guidance of Jozimo Santos Rocha and Tommaso Alacevich at FAO, and Marwa Mahgoub and Dalya Ashour at IFC.

Authors

Hadi Fathallah and **Jozimo Santos Rocha**

Food and Agriculture Organization of the United Nations

Arzaq Al-Najjar

International Finance Corporation

Additional support

The study benefited from the review and feedback of Ashraf Alhawamdeh and Mohamed Farea at FAO, and Robert De Groot and Moneef Sultan at IFC. The authors are grateful for the guidance and support of Mohamed Sallam, Mohamed Gahgah, Libanda Birgadier, Kamau Wanjohi, all at FAO. Special thanks go to the key stakeholders consulted through the process, whose identities have been kept anonymous. Their insights and discussions have been invaluable in building a clear understanding of the policy process and institutional setup in the fisheries sector in Yemen.

Acronyms and abbreviations

ACLED	Armed Conflict Location & Event Data Project
AFI	Acute Food Insecurity Classification (IPC scale)
AFPPF	Agriculture and Fisheries Production and Promotion Fund
AMN	Acute Malnutrition Classification (IPC scale)
BIP	Border Inspection Point
CAC Bank	Cooperative & Agricultural Credit Bank
CGA	Coffee General Authority
CQI	Coffee Quality Institute
DMCC	Dubai Multi Commodities Centre
FAO	Food and Agriculture Organization of the United Nations
GAFTA	Greater Arab Free Trade Area
GDP	Gross Domestic Product
GDPP	General Directorate of Plant Protection
GTZ	Gesellschaft für Technische Zusammenarbeit (German Society for Technical Cooperation)
HACCP	Hazard Analysis and Critical Control Points
HiHI	Hand-in-Hand Initiative
ICO	International Coffee Organization
IFAD	International Fund for Agricultural Development
INGO	international non-governmental organization
IPC	Integrated Food Security Phase Classification
IRG	Internationally Recognized Government (Aden)
ITC	International Trade Centre
MAI	Ministry of Agriculture and Irrigation (northern Yemen)
MIT	Ministry of Industry and Trade
MFW	Ministry of Fish Wealth
MoAIF	Ministry of Agriculture Irrigation and Fisheries (southern Yemen)
NGO	Non-governmental Organization
OCHA	UN Office for the Coordination of Humanitarian Affairs
OEC	Observatory of Economic Complexity
PPP	purchasing power parity

SCA	Specialty Coffee Association
SDG	Sustainable Development Goal
SFD	Social Fund for Development
SMA	Standards and Metrology Authority
SMEPS	Small and Micro Enterprise Promotion Services
TA	Technical Assistance
TCP	Technical Cooperation Programme
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USD	United States (of America) Dollar
WTO	World Trade Organization
YER	Yemeni Rial

Contents

Figures

Tables

***Photo by** FAO Yemen 2020*

Executive summary

Albeit a niche, coffee is one of Yemen's most promising sectors with great export potential, providing an opportunity for rural economic development and the diversification of farmers' incomes. Coffee is planted in only 2.4 percent of all cultivatable land in Yemen (an estimated 34 981 hectares), which yielded coffee production of 20 812 tonnes in 2019 and contributed around 6 percent of all Yemeni agricultural export revenues in 2020: an estimated USD 20.2 million out of a total of USD 320 million.

Located within the global coffee bean belt, Yemen was once one of the world's major producers and exporters of coffee, with mocha coffee associated with Al Mokha port, historically a major hub for coffee exports out of Yemen. Coffee has been planted in Yemen on mountains and valleys ever since it was introduced and adapted to the arid Yemeni climate, where both rainfed and irrigated varieties are cultivated mostly on terraces. Arabica is the dominant species in Yemen, with two main varieties being planted: Typica and Bourbon. The varieties grown in Yemen tend towards more deep chocolate tonnes, but the natural coffee processing contributes a dynamic winey characteristic that distinguishes Yemeni coffee, which has a different taste from the wide spread Robusta coffee that is sold commercially globally.

Before the conflict in 2015, Yemen's fish exports reached 50 countries in Asia, Africa, and Europe, yet about 58 percent of the exports stayed in 12 countries in the Arab region. From 2000 to 2010 the average total annual market value for fish products was USD 188 million. A boom was witnessed in 2013 and 2014, when the total exports reached USD 289 million. As a result of the conflict, the fishery export market value shrank substantially, reaching USD 74 million exported in 2018. In terms of volumes of fish produced, fish quantities de-creased from 195 370 tonnes in 2014 to 83 865 tonnes in 2019, while the volumes exported reduced from 97 685 tonnes to 31 988 tonnes in the same period.

The coffee value chain in Yemen is largely driven by private sector actors engaged in the production, processing and commercialization of three differentiated coffee products: the commercial and specialty coffee green beans, and Qishr, the Arabic word for husks or peels as well as the special beverage made from them, a.k.a. 'Yemeni Coffee.' On average, around 60 percent of Yemeni coffee green beans (including

commercial, specialty and Qishr) are destined for export, leaving around 40 percent for the domestic markets. Over the past decades, Yemeni coffee production has been volatile, with production peaking in 2004–2008 only to decline afterwards. Production recovered briefly from 2012–2014, but has not fully recovered since. Exports in turn, increased from 44 000 tonnes in 2000 to 75 000 tonnes in 2005, but since 2014, exports have started to decline sharply, dropping to 36 000 tonnes in 2019. While the coffee bean variety may be the same, what differentiates commercial and specialty coffee is the amount of effort exerted upstream in the value chain at farm level. The amount of care given to the coffee tree (watering, pruning, fertilization, etc.) and in the production of the coffee cherry (picking time, sizing, color, drying and moisture level) marks the difference in the quality of the coffee bean produced and the mark-up received by the coffee farmer. Yemen's coffee sector is built on the efforts of small-scale farmers, where the average land ownership is around 0.3 hectares (or 394 coffee trees), with an average production of 114 kg of coffee per farmer. From there, traders, wholesalers and exporting companies channel the commercial and specialty coffee to consumers.

Marketing Yemeni coffee, whether commercial, specialty or Qishr, is a major challenge as there is neither price differentiation nor branding. In the domestic market, locally-produced coffee enjoys no special treatment and is sold at regular prices just like any other spice or herb in the market. Coffee is normally marketed through the local spice shops, supermarkets, and grocery stores directly to consumers. Marketing Yemeni coffee in export markets is even harder, as it depends on long-standing business relationships with importers and follows different quality standards. The internet and social media have opened new avenues for marketing Yemeni coffee, and the opportunity for new players to enter the export business. While Yemeni specialty coffee can fetch very high prices in markets that appreciate premium coffee, the high production, processing and marketing costs along the supply chain are major bottlenecks for expanding sales through this attractive market channel. On average, farmers spend 41 to 45 percent of their total coffee revenue on production costs, while operation costs are estimated at 69 percent for processors, 89 percent for domestic retailers, and 60 percent for exporters. For processors, input costs (including coffee beans) account for 45 percent of revenues, but operational, administrative and taxation costs are the highest among all value chain stakeholders: 24 percent due to higher maintenance and operational costs. In the case of domestic retailers, input costs are around 83 percent , which includes the cost of coffee, while operational costs (rent and electricity) amount 6 percent. For exporters, the input costs are at around 45 percent, with operational, administrative and tariff costs adding another 15 percent to their total costs.

The main export destinations for Yemeni coffee products are Saudi Arabia, United States of America and the European Union. In 2019, Yemen exported around USD 20.2 million worth of coffee beans products, up around 11 percent from 2018. Yemen also exports Qishr. In 2019, it exported around 1200 tonnes of Qishr valued at USD 2.5 million, with USD 2.2 million of that coming primarily from Saudi Arabia. The Saudi Arabian market is the top export destination for Yemeni coffee products, accounting for around 63 percent of all coffee exports, valued at around USD 12.6 million in 2019.

The coffee value chain faces major internal constraints, which highlight the need for firm level upgrading and improvements in the enabling environment. The conflict that began in 2015 has severely impacted the countries' governance, which has divided the country into two warring parties and governments. This has weakened the institutional setup, and outdated policy and regulatory frameworks supporting the agricultural sector as a whole, but with particular impact on coffee. Such division in the governance framework has become a major bottleneck inhibiting growth of the coffee sector, leaving the main value chain stakeholders to contend with two governments and two taxation systems, with regulations and policies that frequently conflict. The conflict has also forced stakeholders to choose sides, often resulting in loss of business and access to markets and services.

Governance of the coffee value chain is split along various mandates of different government organizations, resulting in bureaucratic complexity and contributing to limited government support for the sector. Governance of coffee production is under the Ministry of Agriculture and Irrigation (MAI), while anything related to trading and exporting is under the auspices of the Ministry of Industry and Trade (MIT). The Standards and Metrology Authority (SMA) is the government organization responsible for setting the standards for coffee quality and the description of Yemeni varieties and classification of beans, but it does not have any written standards nor classification for Yemeni coffee beans and its varieties. Testing and certification laboratories, not to mention research centers for enhancing coffee varieties, are virtually non-existent in Yemen. The private sector has picked up the mantle for setting the quality standards, with the Specialty Coffee Association (SCA) of Yemen setting standards for specialty coffee in addition to providing third-party quality verification and testing. Standards and classification for commercial coffee is still unaddressed by any player in the value chain.

Since 2002, the government's policy has not changed to better support the development of the coffee industry and investments in the coffee sector to increase production and exports. Most of the government stakeholders involved in policymaking and implementation have limited knowledge about the sector, which further compromises the already limited financial and human resources available for support. Yet, since 2017, Yemeni coffee has been gaining traction thanks to the efforts of a few private sector players who have been marketing Yemeni coffee through their own means. While Yemen has agricultural, environmental, water and cooperative strategies, policies, and laws, coffee is rarely cited or targeted. Coffee is only cited when development organizations highlight it as a substitute for qat farming, a cash crop that is water-intensive but nonetheless a major stable source of income for many Yemeni farmers. Recently however, the government's interest in coffee has picked up as it seeks to use the sector as a means to increase exports and foreign currency reserves. The Internationally Recognized Government (IRG) in Aden and the authorities in Sana'a are both taking steps to regulate the coffee market, promote production and expand exports.

The conflict has severely increased the cost structure for all players along the coffee value chain, making Yemeni coffee less competitive both locally and in export markets. Given the active conflict and the deteriorating transportation conditions, moving coffee to local markets, trade hubs and then to export markets has become riskier and costlier for traders. Most of the coffee production is concentrated in the north, especially in the areas of Sana'a, Sa'adah, and Amran. The economic decline caused by the conflict and the ensuing local currency depreciation and inflation, has resulted in stagnant returns for farmers who are paid in local currency, pushing many to abandon coffee production in favor of staple and other cash crops.

Securing financing in Yemen in general and for coffee specifically has proven to be very difficult, especially for the smallholder producers, which dominate coffee production in Yemen. While some players still have access to loans from family members and local financers (usually the agents/wakils and wholesalers), this is not always the case. The Government of Yemen instituted a public bank, Cooperative & Agricultural Credit Bank (CAC Bank), and a special fund, the Agriculture and Fisheries Production and Promotion Fund (AFPPF), to support the agriculture sector. Nevertheless, due to the high risk associated with the conflict and economic crisis, the fund has ceased operations and the bank is primarily run as a commercial bank, leaving small-scale farmers to find their own financing avenues. While private sector banks do exist in the market, lending to the coffee sector is almost non-existent.

Investment in the coffee sector has been sporadic and overshadowed by emergency aid. Investments by government and development organizations in the coffee sector have revolved around: 1) technical policy assistance in the form of value chain studies and strategies; 2) investments to increase the production of Yemeni coffee; 3) building the capacities of coffee farmers. No investments were directed towards downstream

facilities and activities, thereby limiting the sector's capacity to improve processing and commercialization of high-quality Yemeni coffee. One of the few investments made recently to the coffee value chain was the international coffee conference organized by Small and Micro Enterprise Promotion Services (SMEPs) – a division of the Social Fund for Development (SFD) – to link farmers and traders with international players. The Arab Spring followed by civil unrest that culminated in the 2015 conflict, has led the redirection of investment towards emergency aid, undermining the capacity development projects intended to support the private sector to strengthen capacities, establish the systems, and build the infrastructure necessary to add value to Yemeni coffee and increase exports.

Along the value chain, several upgrading opportunities are of priority to overcome the challenges that hinder the growth and competitiveness of Yemen's coffee value chain, which can be largely mitigated with the right investments, policy reforms and technical assistance (TA). These include:

1. **Input supply:** a) increasing farmer access to inputs, equipment (including irrigation technologies) and training in seedling and organic fertilizer production; b) training the farmer workforce on input production and nursery management; and c) build capacities in new methods and technologies for input production at farm level.

2. **Production:** a) training farmers in farm management and production practices including intercropping, tree upkeeping and harvesting; b) improving access to finance for the introduction of new sustainable irrigation methods; c) scaling up adoption of soil management software and hardware for better decision-making and expanding the dissemination and use of information for early warning in coffee production; and d) support cooperatives to improve their management, operations and governance in order to provide necessary production and marketing support for coffee farmers, including aggregation and value-added services.

3. **Transport and processing:** a) increasing capacity and access to capital for investors and groups of investors (production alliances) to expand value-added capacity close to farming areas; b) providing capacity building for farmers for coffee processing in accordance to international standards and preferences; c) strengthening cooperatives to expand drying centers at the village level and supporting farmers in value addition (processing methods, flavor customization); and d) establishing coffee hubs to provide coffee farmers, cooperatives, and traders with access to warehousing, milling, sorting, roasting and packaging facilities following international standards, provide classification of Yemeni coffee beans, and facilitate access to technical advice.

4. **Marketing, support services and enabling environment:** a) improving coffee quality through accreditation and quality assurance certification; b) developing the Government of Yemen's capacity for export promotion through the development of specialized economic/agrifood attaches in target export countries; c) building and equipping laboratories with better service provision capacity (processes and knowledge of standards), improved equipment, and human resources with skills for state-of-the-art testing techniques and official hazard analysis and critical control points (HACCP) control implementation; and d) assisting the government in building up an automated online information system that is openly accessible and caters to the needs of different stakeholders along the coffee value chain.

Chapter I

Photo by *FAO Yemen 2020*

Introduction and methodology

1.1 Background and the engagement

The Government of Yemen asked FAO to support the process to establish a new comprehensive policy and investment framework for agriculture, food and nutrition security, and resilience through FAO's Hand-in-Hand Initiative (HiHI). The HiHI is an evidence-based, country-led and country-owned initiative to accelerate agricultural recovery, transformation and sustainable rural development to eradicate poverty (Sustainable Development Goal, SDG, 1) and end hunger and all forms of malnutrition (SDG 2). In response, under the umbrella of the HiHI Initiative, FAO mobilized resources via a Technical Cooperation Programme (TCP) to assist the Government of Yemen, embarking on a diagnostic phase that included value chain studies in those areas for which Yemen has a competitive advantage for exports and where significant private sector investment can be leveraged for growth.

As part of an important aspect of the initiative – namely, collaboration with other institutions – FAO partnered with the IFC, the World Bank Group's specialized institution in private sector development and investment, to conduct two value chain studies for Yemen's coffee and fishery sectors. Through an effective partnership between the FAO Representation in Yemen, the FAO Investment Centre in Rome, and IFC's Creating Market Advisory (CMA) unit, this study was designed as a strategic document to guide future policy and investment efforts in the sectors, providing the essential cornerstone for future collaboration between the two organizations towards the development of Yemen's coffee and fisheries sectors.

1.2 Methodology

The study is based on a mixed-method approach. The team conducted an extensive literature review on the Yemeni coffee sector including reports and findings from prior assessments. Field visits were conducted from July to December 2021 in Sana'a, and a range of key respondents with targeted stakeholders along the coffee value chain. Primary data was collected through surveys (fielded between July and September 2021) and raw data was gathered from government and private sector sources. Some secondary data (statistical data and analytical information) was gathered from FAO reports, the World Bank, and the International Trade Centre (ITC), multiple donor organizations, and other relevant sources.

By using both qualitative and quantitative findings, the study offers a critical review of the current status of the sector. Through surveys (Annex II. Key respondents) targeting specific stakeholders in the value chain, interviews and primary and secondary data collection, the team assessed a wide range of factors governing the sector, such as impacts from the 2015 war on coffee infrastructure, numbers of people and businesses associated with the industry, issues affecting coffee yield, regulations and governance issues, quality and standards, internal and external markets, handling and processing, transportation issues, and the roles of women, cooperatives, and other stakeholders. The assessment included analysis of the sector's status and development, including areas for future technical assistance or support, based on extensive discussions with key players in the market. The study covered the 15 coffee-producing governorates (Lahej, Thamar, Abyan, Sa'ada, Aldali, Taiz, Hodaida, Sana'a, Ma'reb, Ibb, Albayda, Amran, Rayma, Almahwit, and Hajjah). The team reviewed the investments, infrastructure development projects, and scale of the coffee sector in Yemen prior to and after the 2015 conflict, and examined the state of affairs following the impacts of the war, how the sector continues to operate, and the multiple opportunities for support to rebuild or strengthen its contributions to development, greater resilience, and sustainable livelihoods.

The results of this study are intended to inform strategic thinking on where the Government of Yeman and the private sector should lead the coffee industry in coming decades, and how to design policy and future development and investment programs to rehabilitate the coffee sector and maximize its potential, improve population livelihood in coffee producing areas, reduce poverty, and create employment, and to support the growth of the private sector working in the coffee value chain in Yemen.

1.2 Overview of study

The overall objective of the study is to build a better understanding of the potentials of the coffee sector in Yemen, analyze challenges and upgrading opportunities, and identify key policy, technical assistance, and investment entry points to increase the private sector's competitiveness and growth along the coffee value chain, and increase the contribution of the agricultural sector to the overall Yemeni economy.

Following the introduction and methodology, Chapter II focuses on the sectoral context and description of the coffee value chain performance, especially in the past decade (pre- and post-2015 conflict). Chapter III presents the structure and dynamics of the value chain and identifies bottlenecks and opportunities for upgrading. The chapter maps the local chain actors and linkages (upstream, downstream, and service providers) providing an in-depth view of how coffee moves along the value chain and is marketed. It also provides an overview of the product flow and understanding of the supply chain costing and value addition along the various segments. Chapter IV offers an overview of the governance aspects and institutional setup and associated policy and regulatory issues affecting the coffee value chain. It then sheds light on the state of basic infrastructure in the coffee sector, and financing facilities that were once available to support the subsector.

Chapter V presents an overview of the different local and export market channels. The chapter characterizes the domestic market and describes main trends in terms of supply and demand in recent years and market opportunities. It then identifies potential export markets and key market players, quantifies potential market sizes, and describes market requirements. Chapter VI analyzes the main constraints and opportunities and digs deeper into some of the underlying causes of the observed constraints, including value chain systemic constraints, macrolevel constraints, and the political economy of the coffee value chain in Yemen. The study concludes with Chapter VII, which maps existing efforts by the government and international actors in Yemen and identifies key actions (policy reforms, investments, etc.) that may be carried out by the private sector, government, and other relevant actors with the support of FAO, IFC, donors, and other international organizations to 'unlock' the sector's potential in the short, medium and long term.

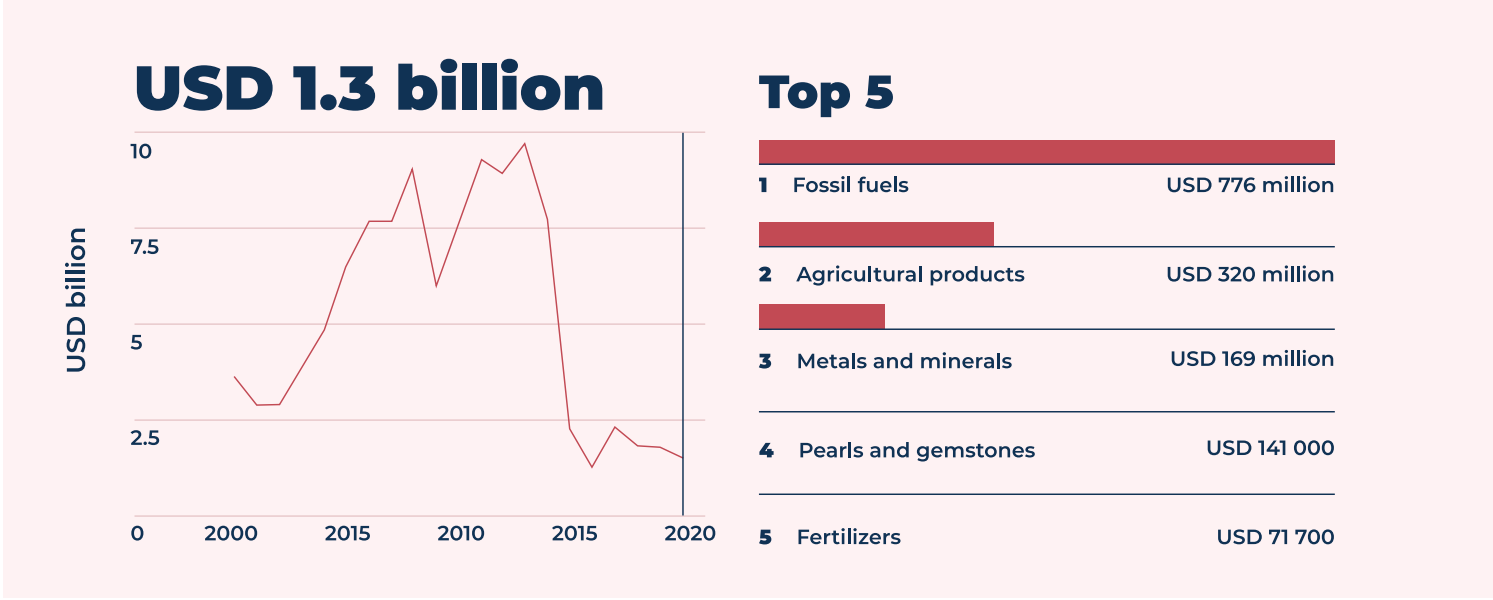
Chapter II

Photo by *FAO Yemen 2021*

The context: agriculture and coffee in Yemen

The agrifood sector is one of the pillars of Yemen's national economy, with coffee being an important productive and revenue-generating, among other cash crops in Yemen. Agrifood in Yemen accounts for about 15 percent of gross domestic product (GDP) and provided jobs for more than 50 percent of the total workforce in the country in 2020 (World Bank Group, 2022). Agrifood remains the main rural income-generating source, meeting a significant part of the population's food needs, and contributing to reduce the incidence of poverty in rural communities by providing livelihoods through agricultural production, including coffee production, processing, and trading. According to MAI's Agricultural Statistics and Information General Directorate, out of 1 452 438 hectares of cultivatable land, coffee is planted on more than 34 981 hectares, producing around 20 812 tonnes in 2019 (MAI, 2022). The agrifood sector accounts for a large portion of non-oil domestic exports. In 2020, agrifood commodities came in second after oil products in terms export value, accounting for about 24.6 percent of all exports (see Figure 1). Coffee export revenues contribute around 6.5 percent of the agricultural export revenues (Chatham House, a.k.a. The Royal Institute of International Affairs, 2020).

Figure 1. Yemen's total and top five exports in 2020



Source: Chatham House. 2020. In: Resourcetrade.earth. London. Cited 31 March 2021. https://resourcetrade.earth/?year=2019&exporter=887&units=value&autozoom=1

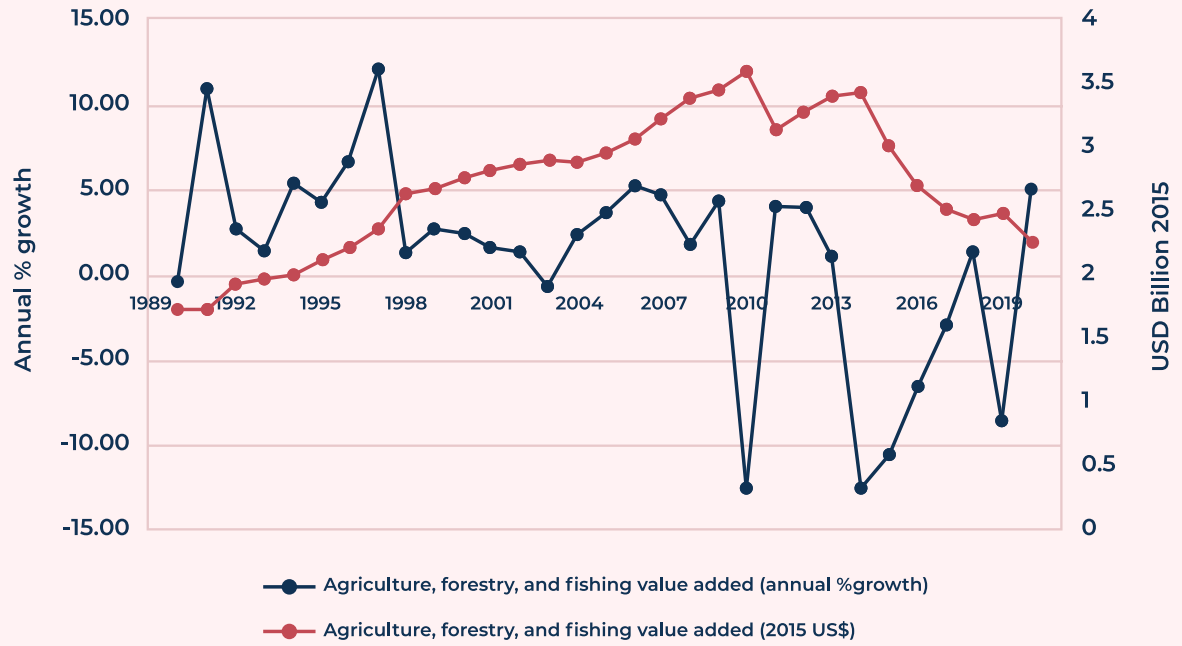
2.1 The big picture: the agrifood sector

Beyond its importance in the Yemeni economy, agrifood activities constitute a key source of livelihoods in Yemen, especially for the most vulnerable. Prior to the outbreak of the conflict, the agrifood sector employed more than half (54 percent) of the workforce and was the main source of income for 73 percent of the population, either directly or indirectly through services and industries associated with the agricultural economy (Ministry of Fisheries Wealth, MFW, 2012)[1]. Unlike most countries, economic dependence on agriculture has been growing because of stagnating opportunities in the industrial (primarily oil) and services sectors since 2000. Nevertheless, as currently set up, the agrifood sector – including fisheries – is not fit to meet Yemen's food security

needs while also leveraging the full potential of the sector.

In spite of the sector's importance, annual growth in agriculture, forestry and fishing has been volatile and tending to decline over the past three decades. Since 2010, the total value of agriculture's value added has experienced a major contraction in real terms, from USD 3.6 billion in 2010 to nearly USD 2.3 billion in 2020 (Figure 2). Agriculture productivity has been low because of insufficient availability of inputs and post-harvest losses, inadequate marketing systems, low human resource capacity, and lack of infrastructure, across all of its subsectors, in addition to the multitude of conflict-related, emerging and structural challenges Yemen faces (Huddleston and Wood, 2021).

Figure 2. Agriculture, forestry, and fishing, value added in Yemen (annual percent growth and total value)



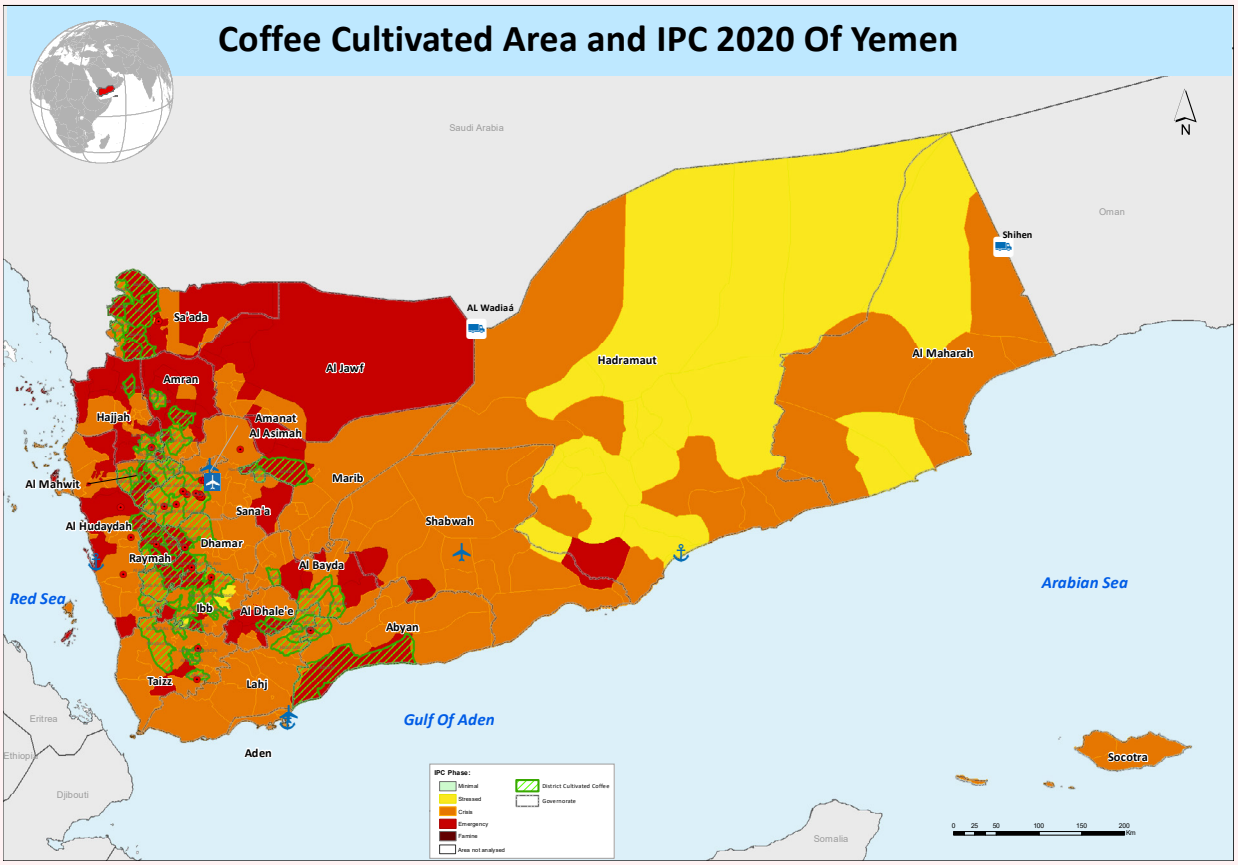
Source: FAO. 2022. FAOSTAT: Crops and livestock products. In: FAO. Rome. Cited on 24 July 2022.https://www.fao.org/faostat/en/#data/QCL/visualize

The principal agricultural systems are in the rainfed highlands characterized by terraced agriculture for coffee, fruits, grains and qat, and extensive livestock production; and in the plains, where irrigated horticulture and grains predominate. About 75 percent of agricultural production comes from these highlands, which are home to 60 percent of the population (MAI, 2022). Most of coffee production areas are dependent on coffee yield profits as their sole source of income, due to lack of intercropping and availability of other economic opportunities.

Yemeni farmers are private sector operators, with close to a 1 million farmer households (MAI, 2022). While malnutrition is closely linked to the humanitarian situation, under the Integrated Food Security Phase Classification (IPC) acute malnutrition classification (AMN), most coffee districts are classified as critical (IPC AMN Level 4), while the agricultural highlands are classified as serious (IPC AMN Level 3), reflecting the heavy challenge Yemenis face in food utilization and access (Figure 3). The coffee farmer is considered to be the poorest farmer in Yemen. Due to their small coffee

agricultural holdings (on average 0.291 hectares with around 394 coffee trees), and low yield (0.57 tonnes/hectare), farmer profits are extremely low (United Nations Development Programme, UNDP, 2022).

Figure 3. Acute malnutrition situation and coffee production areas August–December 2020



Source: IPC. 2020. Integrated Food Security Phase Cited 16 July 2022. www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155480/?iso3=YEM, complemented with FAO and IFC elaborations for this report

The poor access to and utilization of food is driven by a generally dysfunctional food market. The ability of Yemen's physical food markets to operate, including as regards coffee, varies across the country. Yemen's food market system was already fragmented before the conflict due to large distances between markets. The ability of markets to operate after the conflict in 2015 is highly dependent on the security situation, causing volatility in access for both consumers and suppliers. Security restrictions, national currency volatility, high transportation costs, high cost of fuels (for irrigation), and high production costs means that Yemeni coffee is expensive to buy in both domestic and international markets, despite the currency devaluation, reducing its competitiveness at home and abroad.

Given all the emerging and structural challenges, and despite the importance of agrifood within Yemen's economy, the country still depends almost entirely on imports to fulfill local demand for staple commodities. Approximately 80 percent of food consumed is imported; local agricultural production accounts for only 20 percent of overall food availability. Yemen has a food trade deficit of about USD 2.7 billion in 2019 (World Bank Group, 2017). Imported food consists of staples such as wheat, rice, oil, sugar, poultry, and milk while domestic production consists of red meat, fish, fruits and vegetables. Total food imports

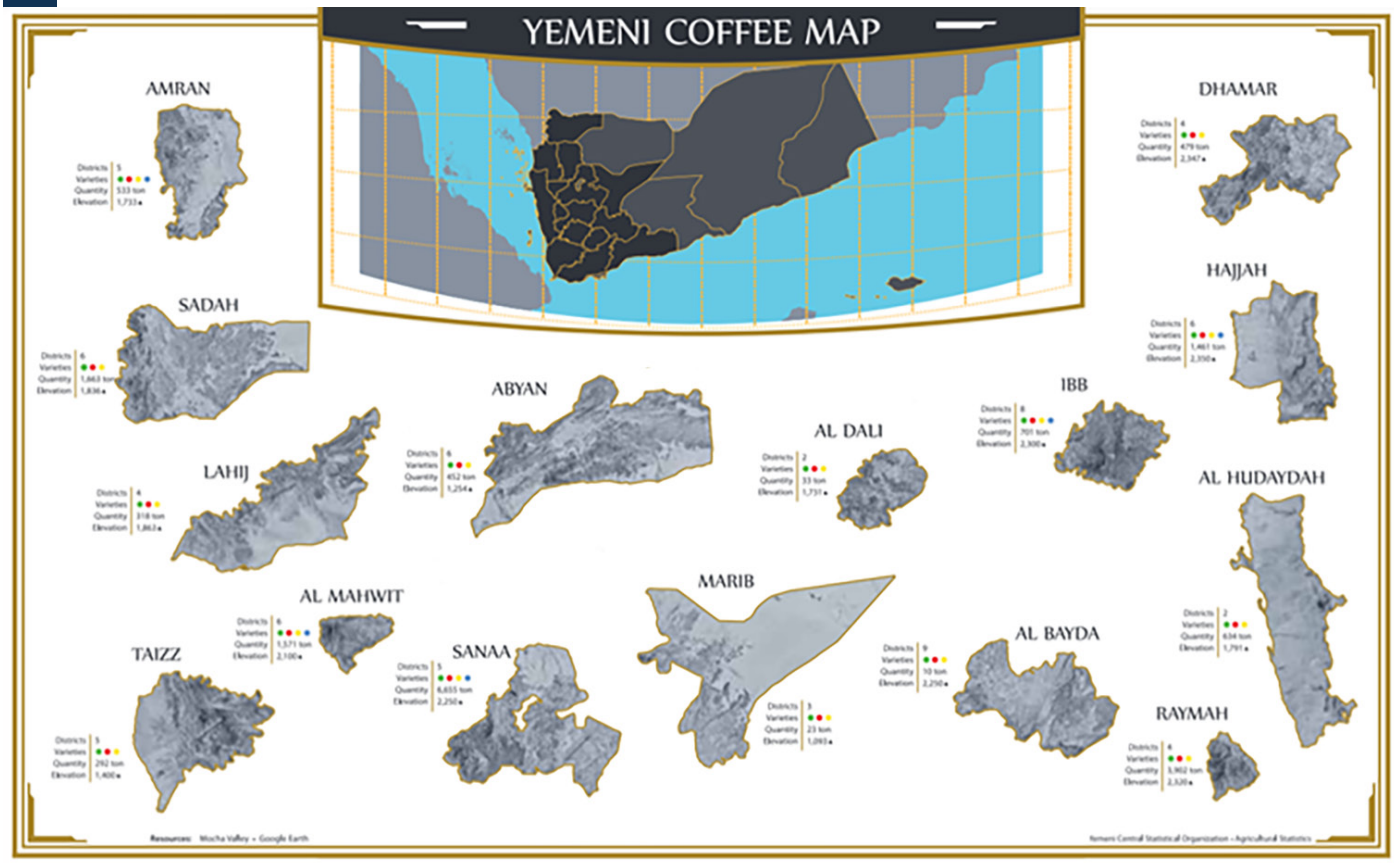
reached 5.5 million tonnes in 2020 with a total value of USD 4.6 billion. Yemen has self-sufficiency in some cereals (sorghum, millet, and barley) and fish, while 85 percent of wheat is imported, along with oilseeds, horticulture, poultry, dairy, egg products and even coffee (World Bank Group, 2021b). Most of the coffee in the local markets is imported from other countries because it is cheaper for consumers compared to locally-produced Yemeni coffee, which is beyond the purchasing power of the average Yemeni consumer.

2.2 In focus: the state of coffee

Yemen is located within the global coffee bean belt line. Coffee is planted mainly in 15 of Yemen's governorates, on mountains and in valleys, and is generally cultivated on terraces (Figure 4). Globally, Coffea Arabica and Canephora (commonly known as Robusta) are the coffee plant species cultivated most widely. Arabica is the dominant species in in Yemen, which plants two varieties: Typica and Bourbon. The varieties grown in the somewhat arid climate in Yemen and under full sun tend toward more deep chocolate tonnes, but the natural processing contributes a dynamic winey characteristic that gives dimension and nuance not typically found in the coffee.

Based on genetic resources and crop evolution studies, we know that – after coffee seeds were introduced into Yemen from Ethiopia – all Coffea arabica L. varieties evolved to adapt to Yemen's arid climate. Among the coffee varieties in Yemen, there are three main genetic clusters: the Yemen Typica Bourbon cluster; the Yemen SL-34 cluster; and the New-Yemen cluster, which is found only in Yemen.

Figure 4. Yemeni coffee planting areas and varieties

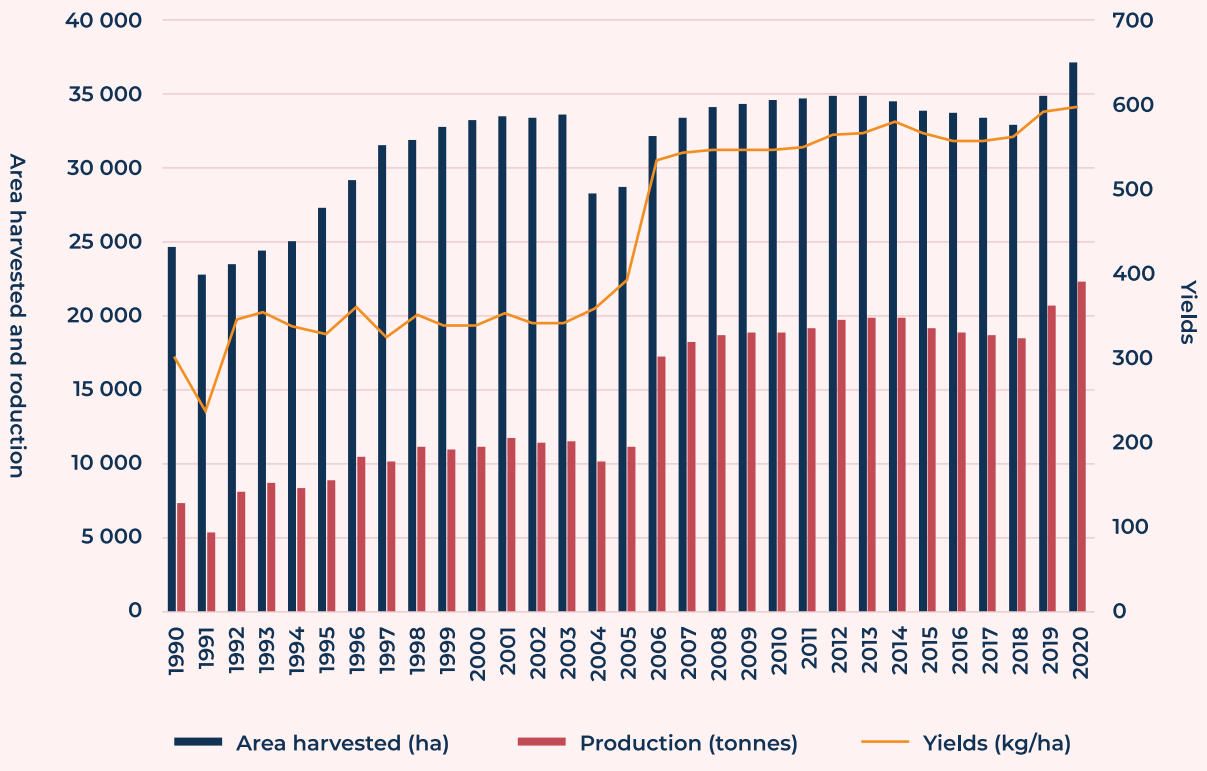


Source: Mocha Valley, 2021. Cited March 31, 2022. Unpublished.

Since early 2000s, the coffee production, area harvested, and yields have plateaued. According to MAI's General Directorate of Agricultural Statistics and Information (also confirmed in Figure 5), out of 1 452 438 hectares of arable lands in Yemen, coffee-planting occurs on about 34 980 hectares distributed over 15 governorates – constituting around 2.4 percent of all arable lands – with an annual production of 20 810 tonnes in 2019. The average yield of a typical coffee farm is around 570 kg per hectare, one of the lowest productivities compared to other producers globally, driven by the arid conditions of Yemen and the fact that Arabica coffee is harvested once per year, unlike Robusta which can be harvested multiple times during the year (MAI, 2022).

Additionally, Yemen exports have reduced substantially, dropping from being an important exporter of coffee to one of the smallest, representing now just about 0.02 percent of all global coffee trade. Exports from Yemen are exceptionally difficult to arrange, not only because of the small amounts of coffee available (making it difficult to fill a container with enough high-quality coffee for shipping), but also because Yemeni coffee quality and taste are under-appreciated due to lack of branding and marketing. While Yemen's production volumes have not reduced recently, exports have dropped sharply since 2014. The sector's challenges were exacerbated by Yemen's economic and social conditions, political instability, and internal conflicts. The conflict that began in 2015 further damaged the country's already decaying infrastructure. The COVID-19 pandemic in 2020 only added to existing layers of challenges by reducing global demand and increasing global export costs.

Figure 5. Area harvested, production and yield of coffee, green in Yemen



Source: FAO. 2022. FAOSTAT: Crops and livestock products. In: FAO. Rome. Cited on 24 July 2022. https://www.fao.org/faostat/en/#data/QCL/visualize

Photo by *FAO Yemen 2021*

Photo by *FAO Yemen 2020*

Chapter III

Value chain mapping and analysis

The coffee value chain in Yemen is driven primarily by private sector actors. Yemen's coffee sector is considered to be small and complicated, with growing interference from the government. With three differentiated products in the coffee value chain (specialty and commercial coffee beans, and Qishr), some stakeholders are common to two or all three products, but each product also has stakeholders unique to itself.

There are three kinds of stakeholders involved in the value chain: 1) Farmers (whether as part of cooperatives or working independently), first processors (called producing companies), collectors, wholesalers (traders and private companies), retailers, secondary processors (dehulling and sorting), local retailers, coffee shops, spice shops, roasters, and exporters; 2) service providers, which includes input suppliers (for plowing tools, fertilizer, pruning tools, drying beds, solar system, generators and pumps, machines and tools), as well as transporters (trucks to transport coffee to main cities, shippers, customs clearance); 3) enabling institutions, which includes government institutions (ministries, authorities, customs, laboratories), financial institutions (mainly banks, and few of small- and microfinance institutions), multilateral institutions and nongovernmental organizations.

Yemen's coffee value chain starts with agricultural production (agricultural inputs, farming practices like pruning, scouting, applying crop inputs such as fertilizers, pest control, weed control, shade tree management) and harvesting. This is followed by the processing phase in which farmers or producing companies dry the coffee beans on the roofs of coffee farmers' houses or in drying centres. Collectors gather the dried coffee from farmers and transport it to central markets in the main districts or cities such as Manakh in Sana'a or Bajel in Al-Hodaida. From that point, commercial coffee is sold to local traders or local spice shops, who sort and mill it internally or through other secondary processors; it is then sold through local coffee shops, spice shops or cafeterias. In the case of specialty coffee, on the other hand, red coffee cherries go directly to production companies for sorting and dehulling. After that, specialty coffee companies divide their products into three categories: specialty green coffee (to be exported), commercial green coffee (to be sold domestically, but also exported upon request) and Qishr or cascara (to be sold in local markets and exported to Arab countries).

Figure 6. The life of a coffee bean

Source: The Queen Bean Coffee Company. 2018. The life of a coffee bean. In: Coffee with the Queen (blogpost of 23 January 2018). City, country. Cited 8 August 2022. https://thequeenbean.blog/2018/01/23/life-of-a-bean/

It takes roughly three years for the coffee plant to bear fruit and it usually produces coffee for about nine years. The journey of the coffee bean starts from the appearance of a fragrant white flower that falls off and is replaced by a green cherry. As the cherry matures, it gradually turns bright red, which is when it is ready to be picked. After drying, the parchment coffee beans are dehulled and sorted, with the husk (Qishr) separated as a separate product.

3.1 Stakeholder mapping

The coffee value chain's main stakeholders can be divided into two categories: 1) Upstream stakeholders, who are responsible for coffee harvesting and product aggregation; and 2) downstream stakeholders, which add value to the coffee products before they are shipped to domestic and export markets. Service providers help the main stakeholders carry out and maintain their activities, and enable value addition within the value chain.

The coffee value chain is divided into two, based on the differentiated product: commercial and specialty (see Figure 7). Coffee beans are internationally classified as commercial and specialty based on several factors: the level of defect in 350 gram of green beans, the size of the coffee beans, and degree of moisture in the green beans. Any coffee that does not meet the specialty coffee standard is considered to be commercial coffee, which is primarily sold domestically at lower prices. Qishr (the coffee bean's outer skin) is sold in large quantities in local markets; the Yemeni people consider it to be the main beverage in most of their social events.

Commercial sector

The lower value of commercial coffee is due to farmers failing to follow appropriate agricultural and processing practices, usually because they are unaware of them. Farmers sell their coffee to collectors or intermediaries in the local market who transport and sell it to big traders in the main cities. The traders control commercial coffee pricing by holding large inventories, releasing or stockpiling quantities of Qishr or commercial green coffee beans based on seasonal demand such as Ramadan, the two Islamic Eids (holidays) or before the harvesting season.

With traders controlling the value chain, farmers have little or no say in the price of their product. Traders provide loans and production contracts to finance production inputs. Traders deduct the money borrowed by the farmers from the amount paid once they deliver the specified amount of dried coffee cherries. Millers are a service provider but not a controller of coffee prices or quantities. Spice shops, where most Yemeni's buy their coffee, can also be millers or coffee roasters, or they can outsource roasting to specialized roasteries.

Farmers are the weakest actor, with the big traders being the dominant actors in terms of pricing, releasing or holding onto quantities; collectors or intermediaries assist traders in exercising control over farmers via loans. Usually, commercial coffee farmers sell their production in one lot to collect payments and fulfil production agreements and loans.

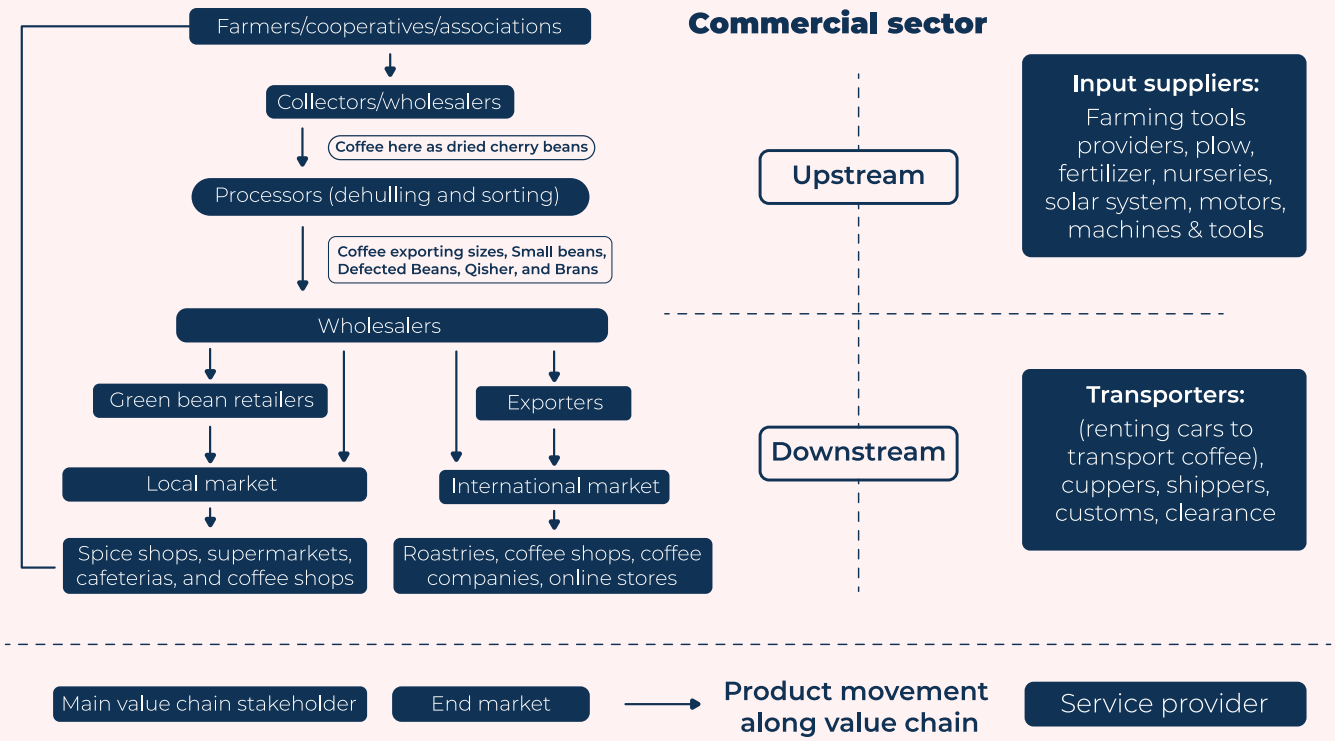
In Yemen, coffee production is a family business handed down over generations. Within the commercial coffee value chain, there are no technical experts who can assist any of the coffee stakeholders, from farmers to millers. There are also no cuppers in the commercial sector to provide any standardization of quality.

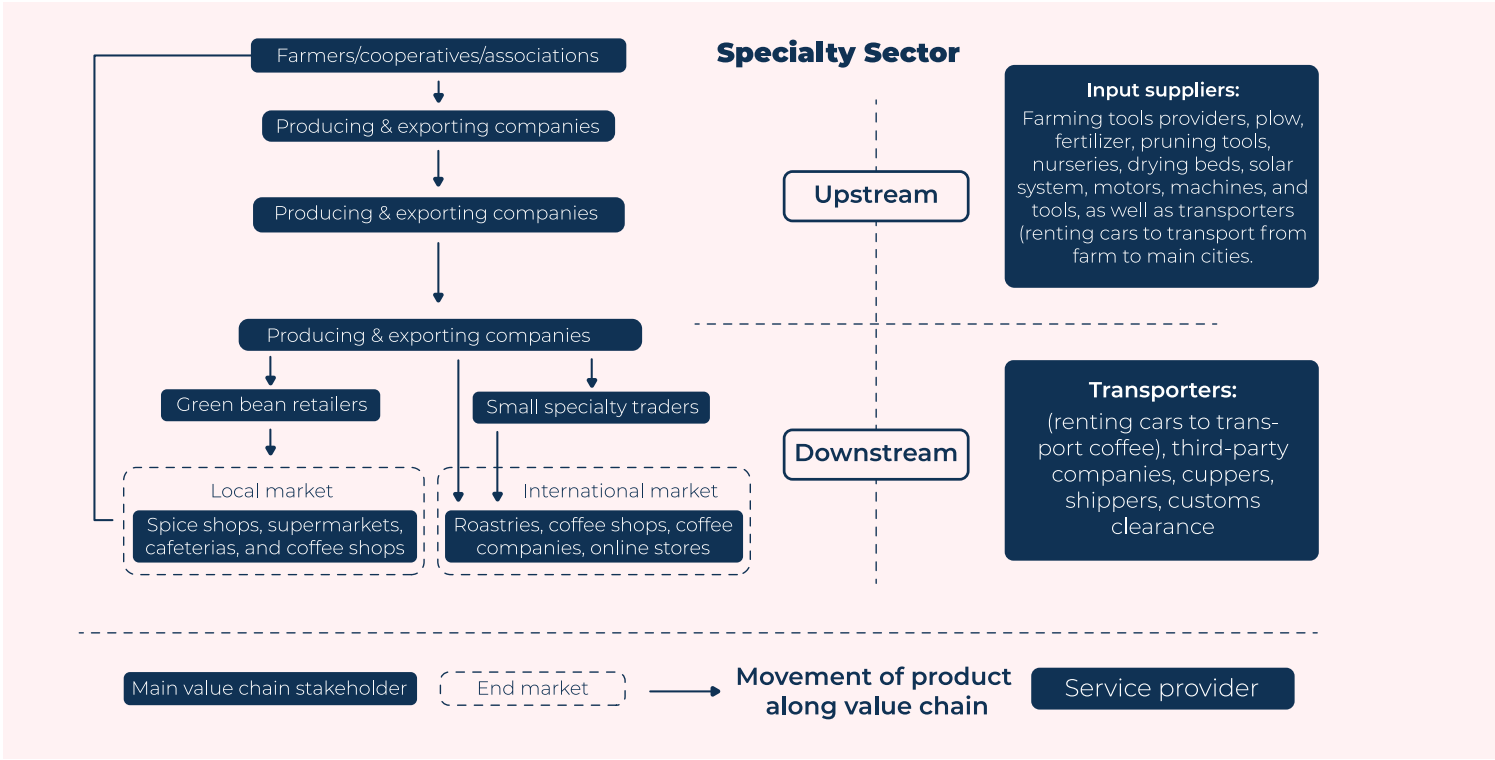
Specialty sector

Specialty coffee differs in the amount of effort and care farmers put into coffee production, from planting, to irrigation, shading, pruning, harvesting and drying, which yields high-quality beans that are considered specialty. Unlike commercial coffee, where all beans are harvested at the same time, specialty farmers pick only ripe coffee cherries from trees, then sell them as red cherries to producing companies or to the agricultural cooperative in their village. Usually, cooperatives and farmers have their own drying centres or pass the drying process on to specialists in Sana'a or Ibb.

Compared to commercial sector mills, mills in the specialty sector are more professional and costly, usually employing modern milling and sorting machines. Sorted coffee is packaged by the producing company in jute bags before delivery to exporters. Exporters, together with producing companies, control pricing in the specialty value chain. These farmers attain higher returns for their coffee compared to the commercial coffee farmer, fetching no less than USD 1.8 and up to USD 3 for a kilo of red cherries, almost double or triple what the commercial farmer would receive.

Figure 7. Main value chain stakeholders in the coffee sector (excluding the enabling environment stakeholders)





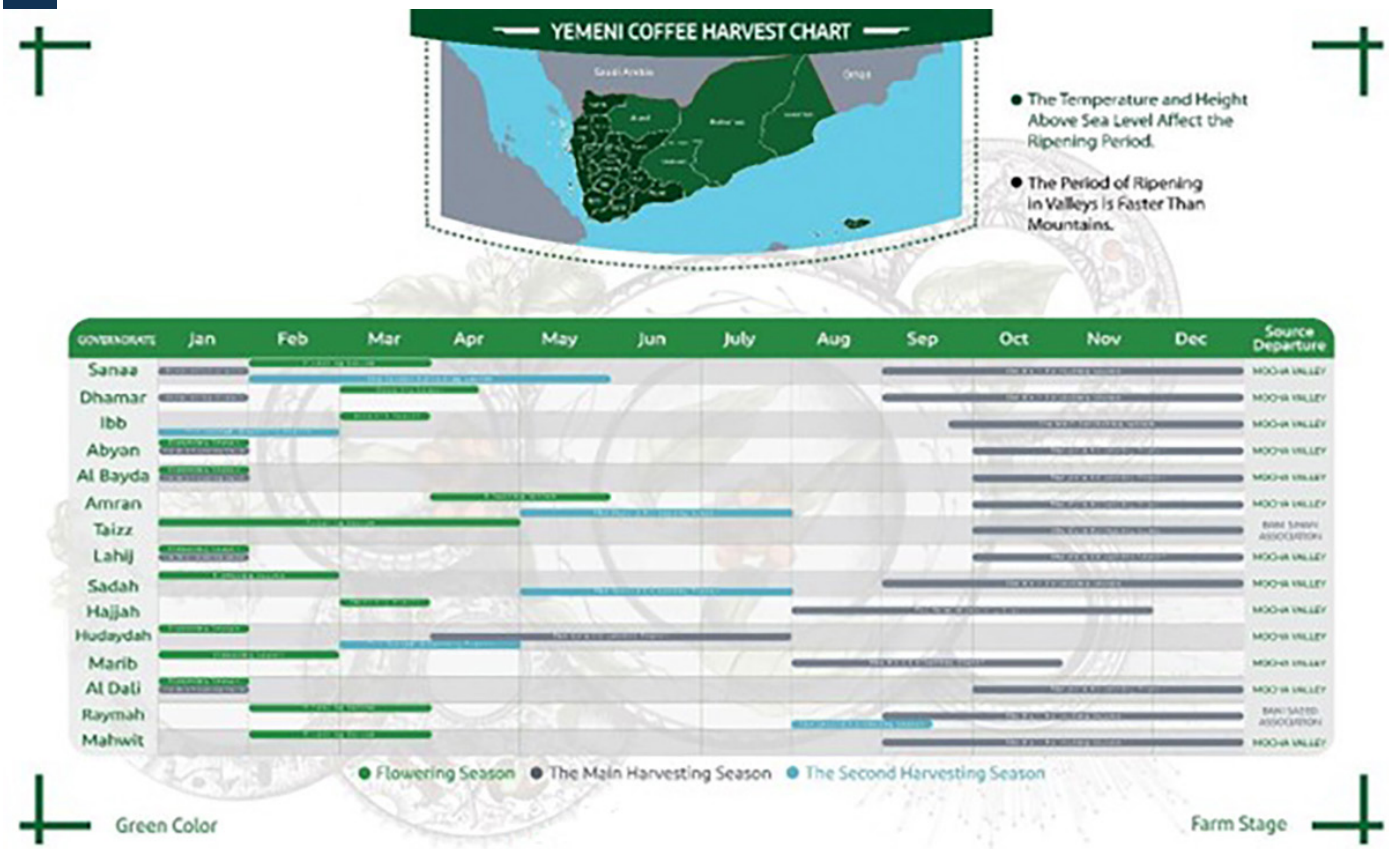
3.1.1 Upstream stakeholders

3.1.1.1 Farmers

The coffee sector in Yemen relies on small-scale farmers, who on average own 0.291 hectares (394 coffee trees) and produce around of 114 kg annually per farming family. Because coffee is planted on terraces on mountains and valleys, it is labour-intensive, based on traditional farming, harvesting, and processing practices. Most coffee lands are not owned by farmers, but are rented from owners who lease out the land. In general, farmers can be classified into: land owners (10–20 percent), and tenants or "partners" who own 25 percent or 50 percent of the yield, based on the agreement between the landlord and the tenant (UNDP, 2022).

Coffee harvesting has two seasons in all the 15 governorates: a main season and a secondary season, based on water availability via rain or irrigation. Harvesting usually occurs seven to nine months from flowering, based on the climatologic and environmental elements (rainfall, height above sea level, temperature, humidity) as well as farming practices such as plowing, pruning and irrigation.

Figure 8. Coffee harvesting season in Yemen's governorates



Source: Mocha Valley, 2021. Cited March 31, 2022. Unpublished.

Small-scale coffee farmers are characterized by low levels of income and investment and a strong dependency on other players upstream in the value chain to get their products to market; they rarely sell directly to retailers. Farmers in the specialty sector are very dependent on the producing companies since they provide drying centres and beds at farmers' villages, which are typically owned and accessed by the companies not the farmers (Table 1).

Table 1. General typology of medium- and small-scale fishery producers in Yemen

Scale of activities	Category & end market	Labour	Assets	Production Flow
Small-scale	Subsistence-oriented (domestic market)	Family members, relatives, neighbors	Ownership or rental of the land	If commercial coffee: almost entire yield is sold locally to collectors or wholesalers as dried cherry beans If specialty coffee: yield sold as red cherries to producing companies

Medium-scale	Subsistence-oriented (domestic market) Generally, only cooperatives can reach the international market	Family members, relatives, neighbors; sometimes also labour from other villages, though this is rare	Ownership or rental of the land	If commercial coffee: almost entire yield is sold locally to collectors or wholesalers as dried cherry beans If specialty coffee: yield sold as red cherries to producing companies

Source: FAO and IFC elaborations for this report.

Farmers in Yemen market their products through various channels. Out of their production, coffee farmers usually keep 5% of the coffee production on farm for self-consumption. The rest of the production is sold to cooperatives, collectors and traders in the local market, mostly in the form of dried cherries. No dried cherries are directly exported. From the 5% of dried cherries that remain on the farm, around 50% is consumed in the form of Qishr, and 50% is consumed in the form of green beans. From the 95% of dried cherries that are sold to the market and processed into Qishr and green beans, around 90-95% of the Qishr is sold through cooperatives and traders on the local market, and around 5% is exported. Nearly 80% of the green beans are sold on the market through cooperatives and traders, while only 15% is sold through exporters to the international market.

3.1.1.2 Cooperatives and associations

In principle, there are more than 100 cooperatives but only a few of them are active; the most active cooperatives are in the north (MAI, 2022). Their role is to support the development of farmers, organizing farmers to safeguard their rights, and market their coffee to commercial traders or specialty companies. Prior to the 2015 conflict, cooperatives were a driving force in the coffee sector. Today, however, they no longer offer farmers healthcare, education, social welfare, water supply, and electricity because the impacts of the conflict (currency devaluation, inflation, physical damage) have depleted cooperatives' financial resources, which comes from both farmers' membership fees and the government support. The cooperatives are in a downward spiral. As the cooperatives reduce their support activities to cut costs, many farmers are refusing to pay their membership fees or are choosing not join any cooperative at all. Today, most cooperatives are either just breaking even or suffering losses. Only a few with good, long-term contracts with specialty companies are surviving and slowly developing themselves and their farmers' revenues. Most cooperatives suffer from inadequate administrative structures, lack of good governance and clear mission, and limited numbers of dedicated and qualified staff. They have poor financial statements and are unable to mobilize funds for investment. Some coffee cooperatives are active in seeking support from international or national non-governmental organizations (INGOs or NGOs) to help farmers by developing their skills and marketing their yields.

Cooperatives do not sell coffee through auctions because they are bound by long-term contracts with exporters and are unable to link directly with international coffee companies, which want to confirm the quality of the coffee themselves or have it certified by a third-party entity, a service that is currently unavailable in Yemen.

The Cooperative Union of Yemen Coffee Producers Associations was established to represent all coffee cooperatives. Due to the current political divide, however, the union is controlled by the northern government and is not accepted by farmers and cooperatives in the south. It is supported by the High Agricultural and Fishery Committee which is an entity formed by the government in the north.

3.1.1.3 Traders and wholesalers

Traders and wholesalers are usually individuals or family-owned businesses with few staff; they own warehouses and storage facilities. Their networks and role as intermediaries between farmers in different areas and players further downstream is their major asset. They are a major link between the value chain's upstream and downstream. Only a few wholesalers have their own mills for dehulling and sorting. They occasionally export products themselves directly to the nearby markets of Saudi Arabia and the United Arab Emirates. They also provide Yemen cities with commercial coffee beans and Qishr, especially in the north where demand for Qishr and coffee is higher than the south.

3.1.2 Downstream stakeholders

Most of the traders, wholesalers and exporters, are based in the north – mainly in Sana'a, the capital of Yemen and a major domestic trading hub – where most of the coffee is produced. There are a few traders in the south – mainly in Aden, where the airport and seaport remained open for exporting since the beginning of the conflict.

3.1.2.1 Exporters

Export companies are either relatively large traders with export offices who can deploy significant capital, or small- and medium-sized companies that are increasingly working in both the specialty and commercial sectors, maximizing the quantities and balancing the risk between domestic and international markets (Chapter V. End market analysis).

3.1.2.2 Processors

Processors exist in two phases in the coffee value chain: primary processors, often called producing companies, are involved immediately after harvesting; secondary processors do the milling and sorting. For most processors, value addition is minimal. Processors in the primary phase dry coffee on their houses (commercial sector), or at dedicated drying centres (in the specialty sector). The only value addition here is managing moisture content during drying. Processors at the secondary phase, contribute more added value in the form of milling, sorting, storing, and roasting.

3.1.2.3 Retailers

Some of the production reaches consumers through spice shops, coffee shops and cafeterias. There are several types of retailers, including dried cherry retailers, green bean retailers, and those who offer coffee beans roasted and grinded. Coffee from various countries is available in local Yemeni markets. Traders, and retailers mix Yemeni coffee with other cheaper beans to obtain higher revenues.

3.1.3 Service providers

There are two categories of service providers: 1) input suppliers, which primarily enable value addition at the farm level; and 2) processors, technicians and experts, transporters, shippers, which enable the products to move along the supply chain.

3.1.3.1 Input suppliers

Coffee nurseries

Seedling production and selling is key to the development and continuity of the coffee sector in Yemen. There are currently 17 main nurseries around country. Most of the commercial and governmental nurseries are mainly planting coffee of poor quality, mixing varieties without proper care for preserving local varieties or increasing productivity, and often without proper pest management. That is why farmers are becoming increasingly dependent on seedling production.

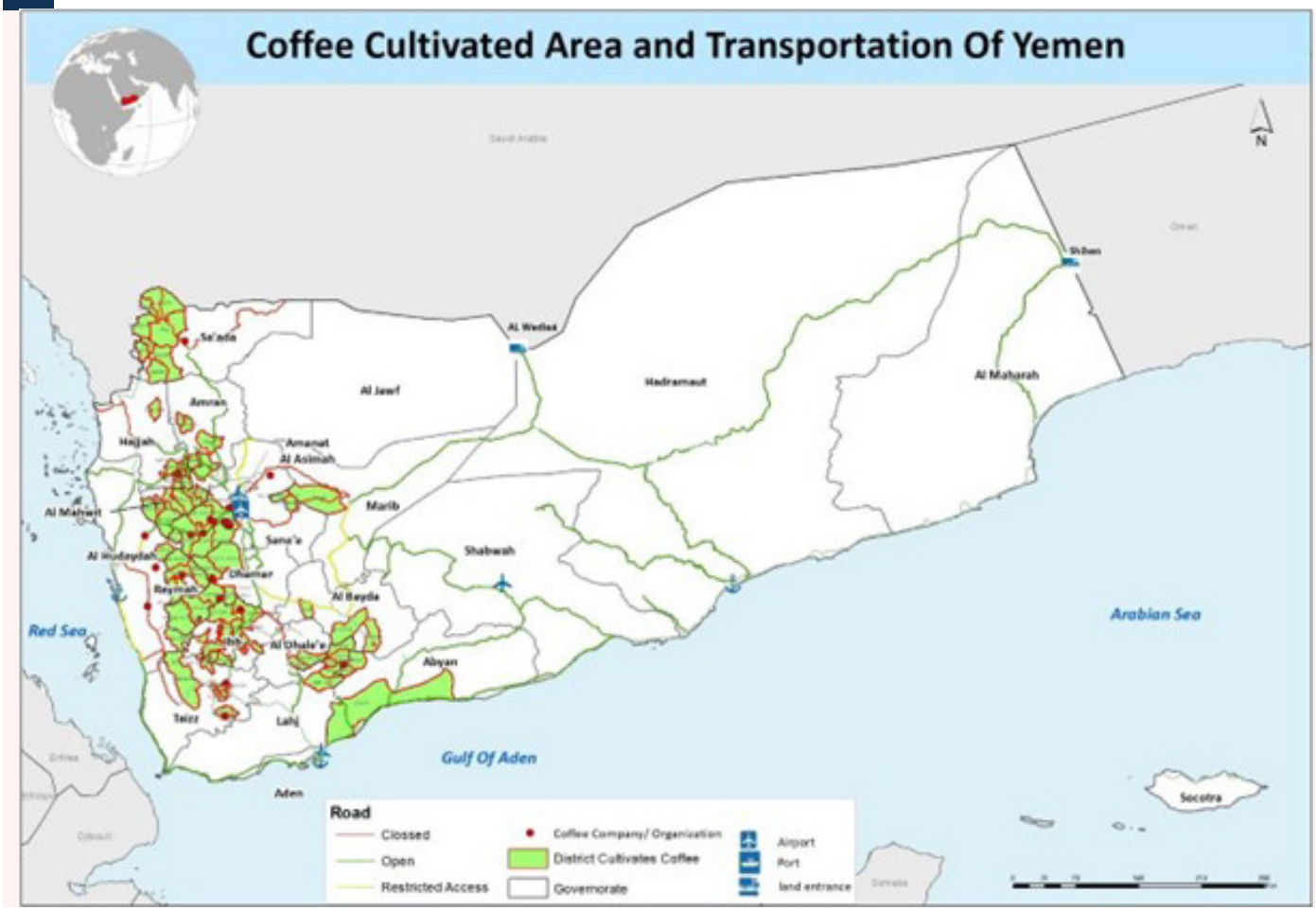
Farming tools providers

Artisanal fishing is still based on manual fishing Farming tools and equipment such as plows, pruning and irrigation tools are almost resourced for all farmers, not only coffee farmers. Plows are hand made mostly inside Yemen, while pruning, shadowing covers, drying nets and irrigation tools are imported. Coffee bags for storing coffee after the drying process are made from plastic jutes, which are also imported. New plastic bags (Ecotact bags) retain coffee bean moisture as long as possible and prevent pests from entering the bags.

3.1.3.2 Transporters

Transportation of coffee is one of the main bottlenecks in coffee production in Yemen. Coffee beans have to be transported from rural villages to cities during cool temperatures, with no sunlight or heat. Coffee beans are highly sensitive to light, heat, or any kind of odors, and thus cannot be transported with other crops. For that reason, coffee beans have to be transported in closed vehicles or during the night. To transport their coffee beans, farmers, traders or processing companies rent cars and small trucks from truck owners who usually have a fleet of vehicles. The conflict has complicated transportation. Movement at night is very risky and often requires extra arrangements for safety. Due to road blocks and active conflict, transporters have to take longer and riskier routes, increasing transportation and fuel costs as the currency depreciates and fuel becomes even more scarce in Yemen (see Figure 9).

Figure 9. Coffee cultivated area and transportation in Yemen



Source: FAO and IFC elaborations for this report.

3.1.3.3 Shippers

Coffee from companies in Taiz, Ibb, Dhamar and other cities must first reach export shipping companies in Sana'a or Aden. These shippers are not dedicated only to coffee, which must be segregated from other crops. Neither do they offer the partial load of containers. As a result, small coffee shipments are often grouped with other products, depreciating the coffee's quality.

3.1.3.4 Third-party entities

Third-party entities play an important role as an evaluator, observer, information and service provider. Third-party entities, whether for-profit (private sector) or non-profit, are rare in Yemen. There are few NGOs providing free training or conducting studies at the request of international donors. Only one third-party company serves as a quality evaluator and provides a knowledge and training centre.

This creates a huge gap between the Yemeni and

international coffee sectors. The absence of such third part entities has hindered advancement of and adherence to quality practices and standards, preventing Yemeni exporters from accessing new markets or increasing their revenues.

3.2 Supply chain costing and value addition

Within the coffee value chain, supply chain costs are high and are estimated at 89 percent of revenues for a domestic retailer, 60 percent for an exporter and 69 percent for a processor/exporter. For farmers, on an average, the total input costs for coffee farming and production account to 41 to 45 percent of the total revenue. Costs of fuel account for almost half of the input costs. The rest includes tool and maintenance costs. Further, coffee producers pay a significant share of the gross value of their production in a variety of taxes, ranging from 8 to 11 percent, as part of the enabling environment support. This includes on average: 5 percent to auctioneering services, 2 percent to the cooperatives, and 3 percent as marketing services charges to the government. Another 40 percent of the gross value goes to pay labour, either in cash or in-kind. Hence the daily profit is around 5–8 percent for coffee growers.

For domestic retailers, input costs are around 83 percent, which includes the cost of coffee, while operational costs (rent and electricity) contribute another 6 percent. For exporters, the input costs are at around 45 percent, with operational, administrative and tariff costs around 15 percent. For processors, input costs contribute 45 percent, but their operational, administrative and taxation costs are higher at 24 percent due to higher maintenance and operational costs (diesel and electricity consumption).

Two major cost trends have increased marketing costs within the supply chain: the currency devaluation and the cost of doing business. Given the volatility of the Yemeni rial (YER) and difference in value/exchange rates between the different governorates, stakeholders are accruing more costs either through currency devaluation directly or increased prices from the preceding stakeholder in the supply chain trying to compensate for daily currency devaluation. This means that when a coffee grower sells coffee, or diesel generator operator sells electricity, or a retailer sells his products, they add a small markup to cover the devaluation risk; this can sometimes eat up all the profit. The markup is individually decided per transaction. The cost of doing business – whether the need to bribe officials to facilitate paperwork or pay local tribesmen and militias to facilitate transportation or access – is also another growing trend due to the deterioration of Yemen's security status and weakness of the central and local governments.

Photo by FAO Yemen 2021

Chapter IV

Enabling environment

The enabling environment for the coffee value chain comprises: 1) the governance framework, which includes institutional stakeholders as well as governing policies and regulations; 2) Infrastructure; 3) and financing facilities, which includes financing institutions and funds available to the value chain's main stakeholders.

4.1 Governance framework

The conflict that began in 2015 has severely impacted the governance framework. With the division of the country into two warring parties and governments, and given the existing weak institutional setup and outdated policy and regulatory framework, the governance framework – rather than being an enabling environment for the growth of the coffee sector – has become an impeding factor, leaving the main value chain stakeholders to contend with two governments with often conflicting regulations and policies. Often, both civil servants and the main stakeholders are caught off guard about which government and policies to work with. The conflict has also forced stakeholders to choose sides, often resulting in loss of both business and access.

4.1.1 Institutional setup

Coffee management in Yemen had always been the responsibility of the Ministry of Agriculture and Irrigation (MAI). The government split after the conflict: the coffee sector in the north is now governed by the Ministry of Agriculture and Irrigation (MAI); the south is under the Ministry of Agriculture, Irrigation and Fisheries (MAIF). In the north, there are two government entities directly involved in the day-to-day management of the sector: MAI's Coffee General Authority, and the Coffee Unit under the High Agricultural and Fishery Committee for Ansar-Allah. There are no counterpart entities in the south. Yemen's coffee policy today in both the north and south is virtually unchanged from what it was 20 years ago, and – though Yemeni coffee has recently attracted some favorable attention on social media, thanks to the efforts of a few private companies – nothing systematic has been done to encourage investment to increase coffee production and develop the industry.

Prior to the beginning of the conflict in 2015, authorities in both the north and south acted poorly in managing responsibilities and obstacles; neither had sufficient knowledge of the coffee industry to engage in effective planning and policymaking. Yet, some restructuring is underway in the north. It has already established local coffee authorities to manage coffee production at the local level. MAI's coffee department has recently been renamed the Coffee General Authority (CGA) and restructured to prepare strategic plans for the coffee sector, organize the sector and assist its stakeholders in overcoming various challenges. While a Coffee Research Centre was founded on 2018 to provide data, analyses, and classifications, no research has actually been conducted due to the lack of proper strategic plans, experts, and funds. And while MAIF has departments specifically tasked with statistics, agricultural extension, and plant protection (which issues the phytosanitary certificates required for coffee export), all are understaffed and currently not operating due to low government salaries.

The government in the north places a high value on improving the agricultural sector. It has identified "knights" or farmer pioneers in each subsector – including coffee planting and cultivation – to promote development. In 2021, it also formed the Coffee Unit under the High Agricultural and Fishery Committee for Ansar-

Allah. This is considered the most active unit within the committee, even eclipsing the visibility of MAI's CGA.

There is confusion between the mandates of the Coffee Unit and MAI's CGA. While the Coffee Unit is the government's principal advisor on coffee management, with responsibility for formulating coffee policy, legislation, and strategic development, the role of regulation remains with MAI's CGA, since it is responsible for implementing MAI's policies. That said, MAI's CGA does not issue licenses, collect taxes, or control coffee quality. Moreover, the work of the Coffee Unit is random, since – despite its directive – the unit has no written policy or regulation to guide proper implementation of any given strategy.

In the south, meanwhile, the government has established no authority or unit for the coffee sector, except in the district of Yafea, were a local NGO supported by the government is hoping to receive government and international donor support to play this role.

4.1.2 Policy and regulatory framework

Prior to Yemen's 1990 unification, the north and south pursued different coffee development policies, while coffee planting and trading was conducted through adhoc random practices that evolved over decades. Today, the coffee sector in the north is guided by a national strategy (2018–2023) prepared by MAI, which recognizes the sector's potential for attaining high revenues. MAI's national strategy endeavors to grow the sector by expanding the number of hectares on which coffee is grown, with the goal of producing 50 000 tonnes of coffee by 2023. However, the strategy did not properly evaluate this proposed expansion and did not put in place any technical standards and practices to guide its implementation. The 2018–2023 strategy does not prioritize objectives or introduce practical solutions to the major obstacles facing the sector, such as the poor governance, uncertainty of the sector's overall performance and its extreme vulnerability.

4.1.2.1 The governing law and international and regional conventions

Coffee is rarely mentioned by Yemen's agricultural laws – which encompass environmental policy; strategies; pesticides; water usage; cooperatives, societies and unions; .etc. When it is, coffee is addressed only as a substitute for qat. When legislation pertains to the coffee sector: decision-making is handled by MAI if the issues concern agriculture; matters pertaining to trading and exporting are under the Ministry of Industry and Trade. Actual legislation is submitted by these ministries to the prime minister, who submits it to the House of Representatives; if approved, it is signed into law by the President of the Republic.

While the government in the north is sincerely trying to improve the sector, it often fails to study matters thoroughly, resulting in decision-making that is unstable and highly random. For example, the Coffee Unit under the High Agricultural and Fishery Committee for Ansar-Allah recently required that coffee exports have two main certificates and an optional third certificate, despite the fact that the certificate-issuing infrastructure is weak.. While the south has not changed its certificate requirements (besides the one certificate issued by Plant Protection), there is no active, coffee-related decision-making entity or representation from the governmental side.

Yemen joined the International Coffee Organization (ICO) in 2008 but is not an active member and is not paying its membership fees. Yemen joined the World Trade Organization (WTO) in 2014.

4.1.2.2 Law implementation and enforcement

While the minister has the power and ability to execute within the current legislation, only minimal action has actually been taken at the ministry level. Practically speaking, managing the coffee sector – e.g. issuing any urgent norms, making any necessary reforms or amendments to regulations – is now under the Coffee Unit under the High Agricultural and Fishery Committee for Ansar-Allah.

The Cooperative Union of Yemen Coffee Producers Associations, MAI and MIT issued a decision to prevent the importation of non-Yemeni coffee beans or dried coffee cherries, yet the decision is not being implemented. On the contrary, non-Yemeni coffee is now imported in even greater quantities and being mixed with Yemeni coffee for export as pure Yemeni coffee. While there are laws governing the usage of pesticides, there is almost no control in the local market prohibited pesticides are sold openly. Likewise, there is no enforcement of water management laws or support for rainwater storage.

SMA is responsible for establishing standards for measuring coffee quality and classifying Yemeni coffee varieties and beans, yet it has no written standards or definitions for Yemeni coffee. As for quality standards, exported coffee beans from Yemen do not actually undergo any quality tests imposed by the government; even the phytosanitary certification is rarely enforced since the government laboratories have no ability to conduct chemical tests.

4.2 Governance framework

4.2.1 Laboratories

Laboratories run by the governmental entities are under the auspices of SMA and the General Directorate of Plant Protection (GDPP). While SMA laboratories are supposed to be capable of providing chemical testing, they have never actually been used for that purpose and their current status is unknown due to lack of access.

The GDPP is occupied mainly with issuing phytosanitary certificates for agricultural products. So, most of the coffee exported from Yemen does not undergo chemical testing while with phytosanitary certificates are issued on the spot.

4.2.2 Research centres

The new Coffee Research Centre is responsible for research in support of the management, development, and environment management of the coffee sector. This includes providing information on coffee bean components, verities and types, quality standards, farm management, coffee processing, and market analysis. Though operational, the CRC lacks funding for the equipment and qualified staff necessary to carry out research projects; so none have yet been undertaken. The Faculty of Agriculture at Sana'a University have pledged to help by requiring students to complete certain research projects to qualify for graduation. However, out of 100 students, only five to eight researched coffee-related matters. The students consider coffee a difficult research assignment because few faculty members are available to advise them

– only two to four instructors at the Faculty of Agriculture in Sana'a University are specialized in coffee – and the high cost (mainly due to logistics related to travel to rural areas where coffee is cultivated) associated with conducting even a small research project on coffee.

4.3 Governance framework

Securing financing in Yemen in general, and for the coffee sector in particular, is very difficult for farmers. While most depend on securing loans from family members and local financers (usually the agents/wakils and wholesalers), this was not always the case. The Yemeni Government used to have a well-instituted banking entity (Cooperative & Agricultural Credit Bank, CAC Bank) and a special fund (the Agriculture and Fisheries Production and Promotion Fund, AFPPF) to support the agriculture sector. Today, however, due to the high risk associated with the conflict and economic crisis, the fund has ceased operations and the bank is primarily run as a normal bank focused in minimal operations, leaving the small-scale farmers to seek their own financing avenues. While other private sector banks do exist in the market, lending to the coffee sector is almost non-existent, even though some banks are exploring the possibility of doing so and some exporters leverage the services of private banks for letters of credit and international banking transfers. The latter practice, however, has been curtailed since international banks became unwilling to do business with local Yemeni banks for fear of being sanctioned by the United States of America. Most of the exporters rely on the 'sarafa' money exchange transfer system through neighboring countries (Saudi Arabia and Egypt) where a Yemeni diaspora is well entrenched, or through offshore banking accounts in the United Arab Emirates.

The Cooperative & Agricultural Credit Bank (CAC Bank) was established in 1982 as a result of the merger of the Agricultural Credit Bank (established in 1975) and the Bank of National Cooperation for Development (established in 1979). Accordingly, it bore the responsibility for financing the agriculture and fishery sector, offering financial and banking services strictly to the agriculture, fishery and livestock sector since its establishment until 2004, when it started offering retail banking services to all sectors.

The AFPPF was one of the institutions and instruments aimed at supporting development efforts in areas of agriculture, fisheries and animal wealth; it provides support, directly or indirectly, through agricultural and fisheries cooperatives and the CAC Bank with loans, grants and guarantees. The fund's mission was to assist smallholder and poor rural families to increase their incomes and improve their livelihoods, and thereby contribute to the stability of the rural communities and curtail the migration to the cities.

Some of the microfinance agencies are currently trying to finance a few of coffee players (farmers, cooperatives, producers, traders, etc.), but face obstacles. First of all, small microfinance agencies and their financial products are designed for short-term agricultural products, unlike coffee, which is a long-term product that farmers and producers can bank on only once a year. Second, knowledge about coffee farm management and practices among the finance agencies' employees is limited; as a result, they cannot even design a financial product tailored to the sector. Third, they request land ownership for land collateral to guarantee the loan, which means most coffee farmers cannot qualify. The medium and larger microfinance agencies (e.g. Thadhamon, Kuraimi, Afaq, Bank Alamal) are willing and interested to work with long-term revenue products such as coffee and grape, but need support in developing loan guarantees so they can extend finance to producers.

Chapter V

Photo by FAO Yemen 2021

End market analysis

Along the coffee value chain in Yemen, coffee beans make their way to either the domestic or export market. On average, around 60 percent of Yemeni coffee green beans are exported, leaving around 40 percent for the domestic consumer. Wholesalers, producing companies, and collectors, who are the link between the coffee farmer and the rest of the downstream value chain, usually select the higher quality harvest for export. The lower-quality beans are left for the local market, where they are often mixed with non-Yemeni coffee (e.g. Indian, Ethiopian). Meanwhile, Qishr export value reached USD 2.7 million with 11 percent of Qishr quantities exported; the bulk remains in local markets because it is considered the official and main drink for consumers in most of the northern cities in Yemen (Chatham House, 2020).

5.1 Local markets

The domestic retail market is essentially limited to four main drinks: Qishr, tea and roasted ground coffee in the north; tea and milk tea in the south. On average, 40 percent of Yemeni coffee green beans remain for the domestic market. Yemeni coffee bean prices are the highest in the world compared to other coffees, and this is true even within Yemeni. In the local markets, there are a variety of drinks originating from coffee, each with their own methods, tastes, and additives.

Table 2. Yemeni coffee prices per kilo 2022–2020

No.	Coffee type	2020 Prices USD/kg	2021 Prices USD/kg	2022 Prices USD/kg	Notes
1	Dried coffee cherries (whole bean with husk before dehulling) *Specialty type*	6.7	6.8	6.2	Price decline in 2022
[2]	Dried coffee cherries (whole bean with husk before dehulling) *Commercial type*	4.7	4.7	3.5	Price decline in 2022
3	Qisher (husk) *Specialty type*	5	5.3	4.5	Price decline in 2022
4	Qisher (husk) *Commercial type*	4	4.2	2.5	Price decline in 2022
5	Coffee green beans *Specialty type*	30	30	35	Traders selling specialty green beans at higher prices to compensate for the price drop in Qisher
6	Coffee green beans *Commercial type*	8	9	8.5	

Source: FAO and IFC elaborations for this report

Table 3. Total quantity and value produced, exported, coffee

Year	2018	2019
Total quantity of dried cherry production (tonnes)	19 676	21 639
Total quantity of green beans exported (tonnes)	3700	3600
Total quantity of Qishr (tonnes)	9838	10 819.5
Total value of exported green beans (USD)	19 400 000	20 200 000

Source: FAO and IFC elaborations for this report

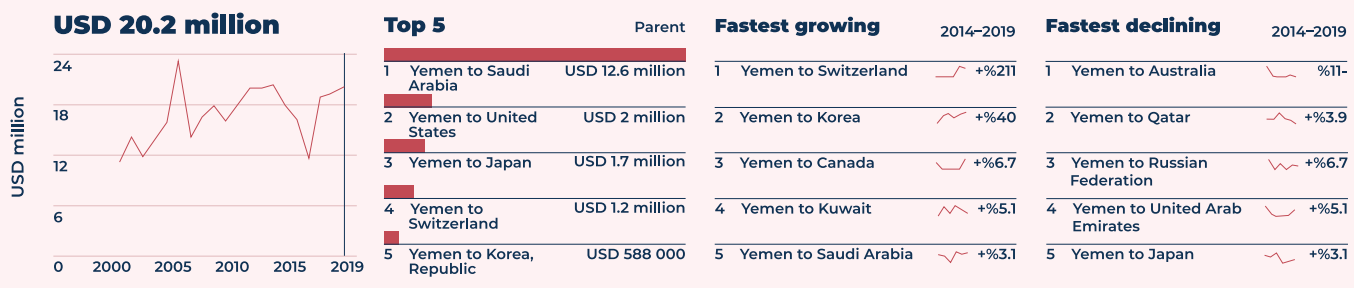
5.2 Export markets

The main export destinations for Yemeni coffee products are: Saudi Arabia (and other Arab countries), United States of America and Japan. In 2019, Yemen exported around USD 20.2 million worth of coffee bean products, up around 11 percent from 2018. Yemen exported about 1200 tonnes of Qishr valued at USD 2.5 million. Of that USD 2.2 of that went to Saudi Arabia, the top export market for Yemeni coffee products. Overall, Saudi Arabia accounted for around 63 percent of all Yemen coffee exports in 2019, valued at around USD 12.6 million. Yet, exports to the United States of America have shown the highest growth in recent years, with exports to South Korea, Thailand, Malaysia, and Singapore increasing significantly between 29 and 55 percent from 2014 to 2019 (Figure 10).

However, exports of all products from Yemen have been declining over the same period (2014–2019), primarily because of the security situation in Yemen and related factors: the desire to replace Yemeni products due to unstable government relations between the countries; and the disruption of trade routes, including in-land transportation to Saudi Arabia and Oman (e.g. cutting off faster and safer routes to border crossings at Al-Wadeah, Haradh, and Al-shahan), and the loss of direct flights between Yemen and its export markets (Sana'a airport is closed to all flights except those for UN employees, airports in Aden and Seyoun airports remain functional though flights are exorbitantly expensive). All this raises supply chain costs and logistical challenges of producing Yemeni coffee and getting it to market, making Yemen's already expensive coffee beans and husks even more so, resulting in declining exports.

Other issues also affect the export of Yemini coffee: mixing Yemeni and non-Yemeni coffee beans and the presence of prohibited chemical components. The latter can result in a whole shipment being returned or damaged.

Figure 10. Top five coffee destinations by value in 2019, including fastest-growing and declining-growth destinations between 2014–2019



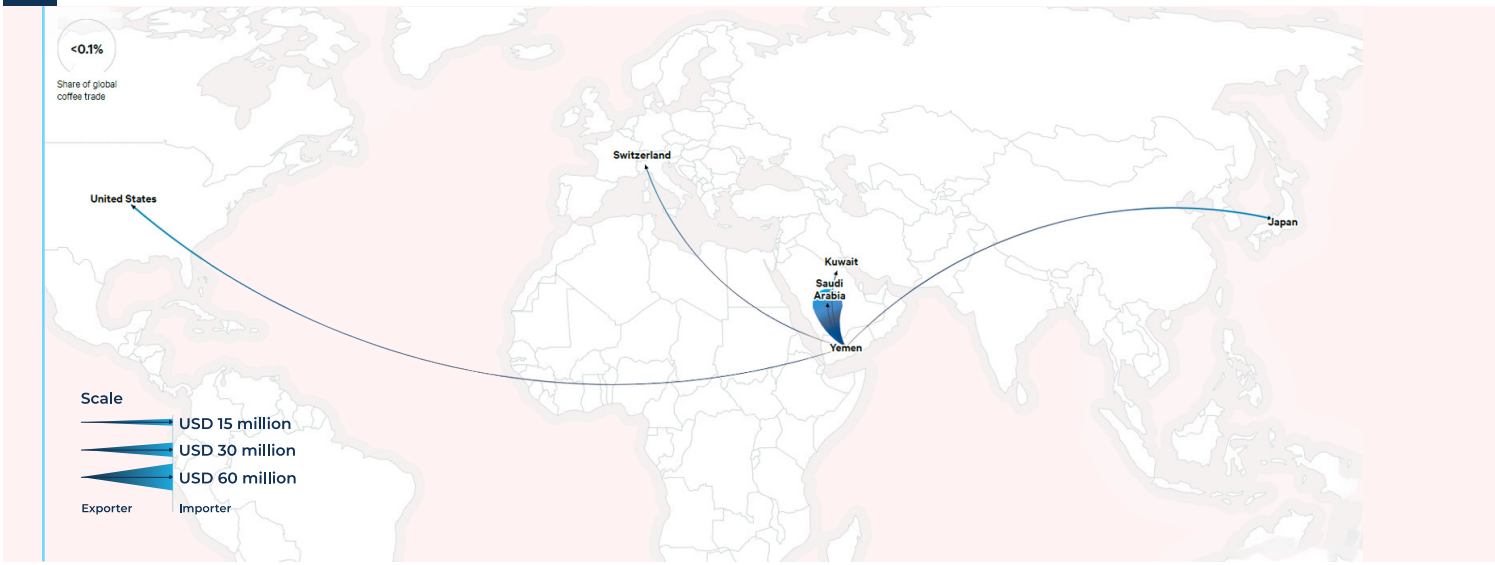
Source: Chatham House. 2021. In: Resourcetrade.earth. London. Cited 31 October 2021. https://resourcetrade.earth/?year=2019&exporter=887&importer=nawa&category=9&units=value&autozoom=1 /

5.2.1 Global markets in context

The Observatory of Economic Complexity (OEC) groups trade data for coffee with that of tea, mate and spices (OEC, 2022a). Within that category, OEC tracks coffee that is roasted and decaffeinated, roasted but not decaffeinated, and unroasted decaffeinated; as well as coffee substitutes that contain coffee; and coffee husks and skins (OEC, 2022a. In 2019, coffee ranked 122nd among the world's most-traded products, with a total trade volume of USD 30 billion. Between 2018 and 2019, coffee exports decreased worldwide by 2.7 percent, from USD 30.8 billion to USD 30 billion. Trade in coffee represents 0.17 percent of total world trade. Total world coffee production was 168.71 million bags (2.8 million tonnes) in 2019–2020; during that period, Arabica production declined an estimated 4.1 percent to 96.22 million bags, while Robusta production grew by 3.7 percent to 72.5 million bags. Yemen's coffee production was a rollercoaster of ups and downs between 2000 and 2019. Investment rounds in the 1990s and 2000s yielded some increase in production, which peaked in 2004 and did not rebound again until 2013. Yemen produced 21 639 tonnes of coffee in 2021 (up 11 percent compared with 2018), constituting around 0.0000021 percent of global coffee production that year, with an average value of USD 20.2 million, or <0.1 percent of the global coffee market value. Yemen is not the only coffee producer in the region. Saudi Arabia produces Arabica coffee and Oman has recently prepared a strategic plan to grow more coffee.

5.2.2 The Arab market

Figure 11. Map of top five export destinations in Arab lands, United States of America, and Japan in 2019



Source: Chatham House. 2021. In: Resourcetrade.earth. London. Cited 31 March, 2022. https://resourcetrade.earth/?year=2020&exporter=887&category=9&units=value&autozoom=1

The major destination for Yemen's coffee product exports is the Arab market, dominated by exports to Saudi Arabia and United Arab Emirates. While Saudi Arabia remains a core market for Yemeni coffee products, exports have been declining around 12 percent between 2014 and 2019, corresponding to the period of Yemen's conflict (Figure 11). Coffee trade within the Arab

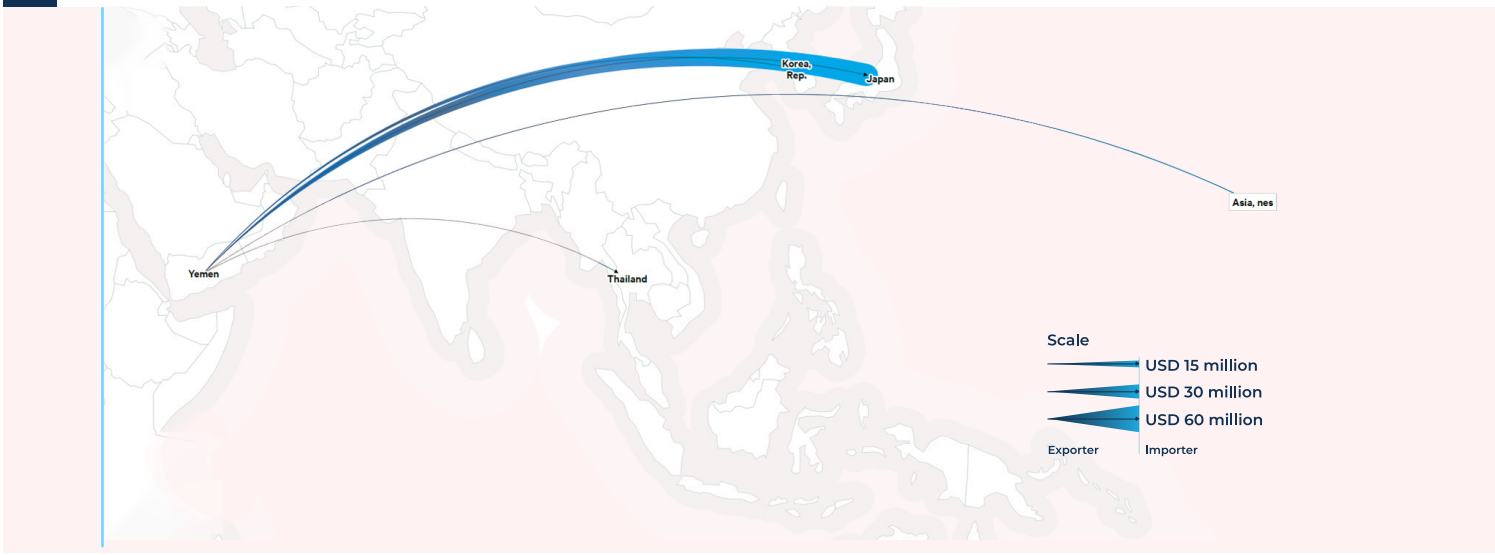
world – where Yemeni coffee is popular – has significant growth potential because its markets are expanding as a result of population growth and higher incomes. Specialty coffee, especially Yemeni specialty coffee, is becoming more frequently requested in the United Arab Emirates since 2002, when the government established the Dubai Multi Commodities Centre (DMCC), which is planned to be the Arab and Near East hub for the global trade of coffee, providing the physical, market and financial infrastructure required.

The Arab countries are a natural destination for Yemeni coffee exports for several reasons. First: geographic proximity, which allows Yemeni exporters to ship products via land routes, a journey that can be as short as two to three days, but no longer than a week. Second: Yemeni expats are well placed in Saudi Arabia and other gulf countries, facilitating trade between the countries; Yemeni traders are usually on both sides of the transaction, removing any language (even dialect) and cultural barriers to doing business. Third: Yemen benefits from the Greater Arab Free Trade Area (GAFTA), which waives tariffs on all products originating from Arab League member states (Yemen joined in 1945). Fourth: Arab countries have more relaxed food safety and standard requirements than other export destinations such as Europe, making it easier for Yemeni traders to access Arab markets.

5.2.3 The Asian market

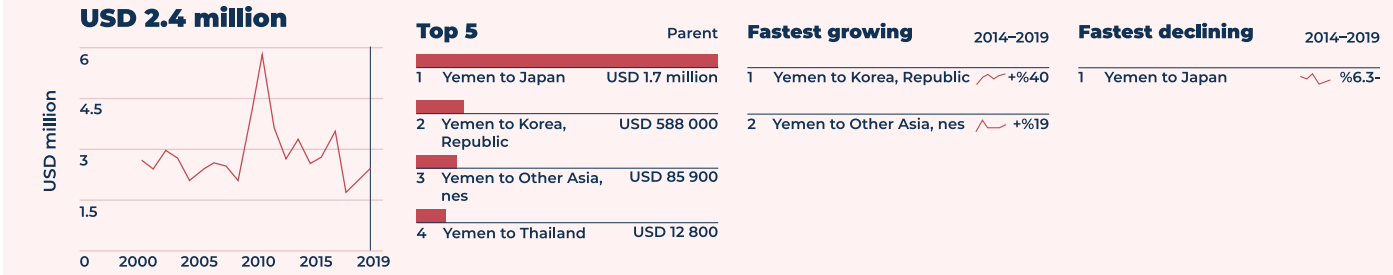
Asia is Yemen's second most important market by value of exports. Main destinations are Japan, Korea, and Thailand, which has seen sharp increase in coffee product exports from Yemen. The demand in the Asian market is only for coffee green beans. While exports to Asia have been up and down, they remain below the 2010 peak of USD 5.9 million, and even that highpoint is far below the market potential for Yemeni coffee in Southeast Asia. This is mainly due to the absence of trade agreements between Yemen and Asian countries that would facilitate coffee exports. As for quality standards and testing procedures, these are usually agreed between importer and exporter. Asian importers of Yemeni coffee generally require only the certificate of origin and health certification from the Ministry of Agriculture and Irrigation (MAI), though a cupping (tasting) report is additionally required for specialty coffee (see Figure 12).

Figure 12. . Map of top five export destinations in Asia in 2019



Source: Chatham House. 2020. In: Resourcetrade.earth. London. Cited 31 March 2022. https://resourcetrade.earth/?year=2020&exporter=887&category=113&units=value&autozoom=1

Figure 13. Top five coffee products exported to Asia by value in 2019, including fastest-growing and declining-growth products between 2014–2019



Source: Chatham House. 2020. In: Resourcetrade.earth. London. Cited 31 March 2022. https://resourcetrade.earth/?year=2020&exporter=887&importer=esa&category=113&units=value&autozoom=1

5.2.4 The European market

Exports to the European market are driven by export of green beans; no export of coffee husks is recorded. Exports to Europe accounted for less than 11 percent of Yemen's total exports in 2020. Exporting to Europe is complicated by banking restrictions and the Saudi Arabian embargo on ports and airports. Unlike exporting to Arab countries, where the established network of Yemeni traders and sarafa money exchange transfer system can facilitate payment, exporting to Europe requires banking services that are not readily available to all traders. The lack of direct flights from Yemen to Europe has restricted exports to coffee samples, which is a longer procedure with added costs. Prolonged delays in shipping samples often causes Yemeni traders to lose clients.

Figure 14. . Map of top five export destinations in Europe in 2019

Source: Chatham House. 2020. In: Resourcetrade.earth. London. Cited 31 March 2022. https://resourcetrade.earth/?year=2020&exporter=887&importer=eur&category=113&units=value&autozoom=1

European markets are open to Yemeni imports. Importers in Europe usually require health and safety documents provided by the Ministry of Agriculture and Irrigation (MAI); on rare occasions, quality checks and testing by third parties are also required by European importers.

Figure 15. Top five export destinations in Europe in 2019, along with the fast-growing and declining-growth in exports between 2014–2019

Source: Chatham House. 2020. In: Resourcetrade.earth. London. Cited 31 March 2022. https://resourcetrade.earth/?year=2020&exporter=887&importer=eur&category=113&units=value&autozoom=1

5.2.5 Incentive to export

Less than one quarter of the Yemeni coffee production is dedicated to exports. In 2019, 3600 tonnes out of the 21 000 tonnes produced where exported, where the price differential between export markets revenue and local market was around 110 percent for commercial coffee and around 145 percent for specialty coffee. Exporters have every incentive to export product rather than keeping it in the local market. Yet, the difficult circumstances – from disruption of transportation logistics, longer routes and rising transportation costs; increasing supply chain costs such as the high price of coffee beans; the high cost of storage (due to longer waiting/ demurrage costs at ports); and rising formal and informal export fees (e.g. official government fees plus bribery costs to facilitate movement of merchandise) – are increasingly frustrating exporters and the traders that supply them.

In 2017, the average tariff in Yemen for Coffee was 23 percent (OEC, 2022). Most Arab and European destinations have almost a 0 percent tariff on Yemeni products. Yemen lacks formal trade agreements with most countries, preventing Yemeni exporters from accessing some important markets, such as China.

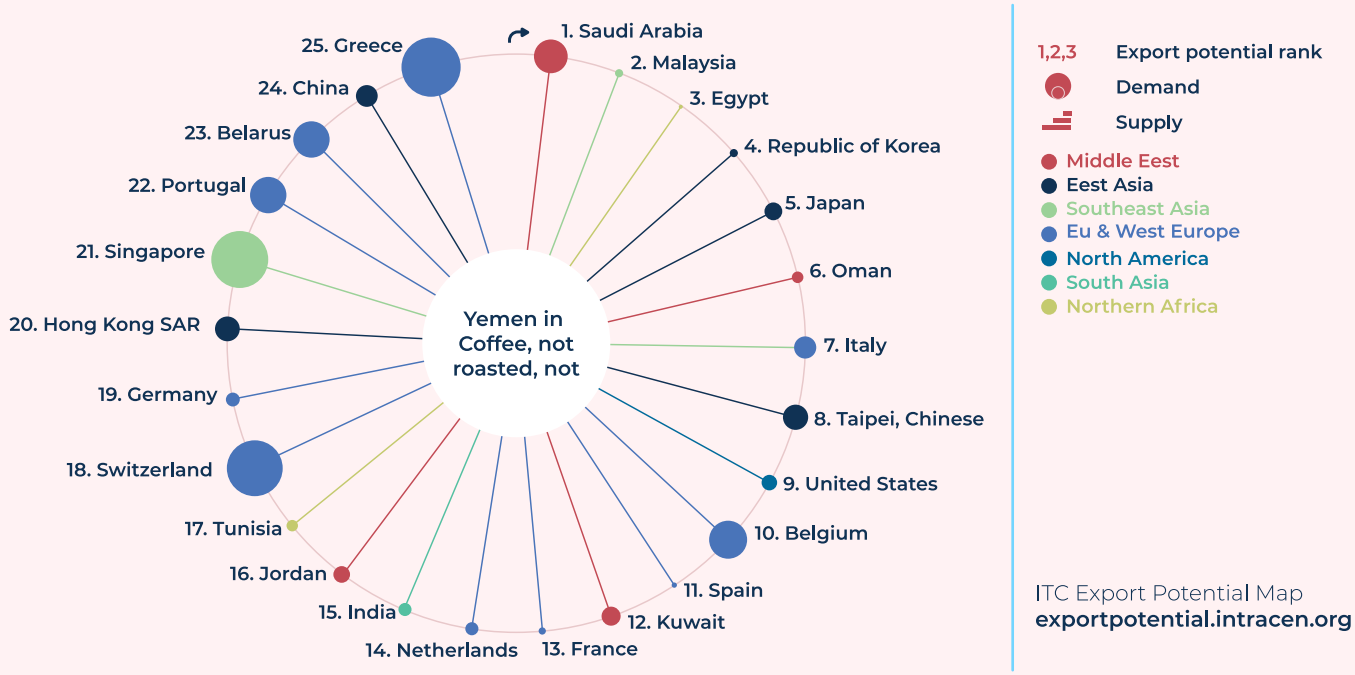
5.2.6 Refocusing Exports to Meet Global Market Demand

Yemen should not only focus on meeting its current market demand but also expand those markets. For example, in addition to selling coffee beans it could sell coffee husks (Qishr), which is becoming more popular globally even though husks are still regarded as waste or fertilizer in some markets. This will require Yemeni traders increase their husk marketing efforts, and to do so in a more professional way. This would include increasing the practice of cupping or tasting coffee to judge its quality. Yemen was introduced to cupping during the 2010 International Coffee Conference, which took place in Sana'a with international coffee experts from all over the

world. Yet, Yemen only began the practice in 2017 and its number of cuppers is negligible; there are only four cuppers (one woman and three men) in the whole country.

Yemen has a huge but unrealized potential in the markets it already serves, especially as a source of raw coffee beans and husk products, where it has a competitive advantage; but also – albeit to a lesser extent – with regard to prepared or processed products or coffee beverages. Yemen exports around USD 20.2 million in raw green beans, which is only 26 percent of its total production; so it could export much more. Beyond the easy-to-access Arab markets, significant but largely untapped opportunites include Italy, Korea, Spain, France, Japan, Germany, Belgium and the United States of America; the latter re-exports Yemen coffee beans to other countries (Figure 16).

Figure 16. Potential export markets for Yemeni coffee beans



Source: ITC. 2021b. Export potential for Yemen. In: ITC Export Potential Map. Geneva. Cited 31 October 2021. https://exportpotential.intracen.org/en/products/analyze?fromMarker=i&exporter=887&toMarker=w&market=w&whatMarker=k

5.3 Quality control and assurance

Quality control is practically non-existent throughout the whole of Yemen's coffee value chain. Farmers, traders, and even exporters implement ad hoc practices to maintain the quality of their coffee, but these do not necessarily meet global export standards. In the specialty coffee sector, exporting companies are working to educate farmers about best practices for producing high quality coffee beans. These companies hire quality teams or quality officers or production officers, who impose self-assessed and sometimes self-made quality standards. While some exporters seek third-party

cupping services of coffee experts outside Yemen, this does not guarantee quality throughout the value chain and inconsistencies in production persist. Most of the time, cupping outside Yemen is conducted by the importer or client who may have a conflict of interest in assessing the quality.

Sana'a-based Mocha Valley is the only entity – public or private – that provides third-party quality control and assurance. This private sector company is also capable of providing its services to other Yemen governorates as well. Mocha Valley conducts most internationally-required quality tests such as cupping, physical tests, and chemical tests of coffee beans.

Cupping has been significant to specialty coffee as early as 1999, when the method was used to evaluate coffees in the Cup of Excellence competitions as early as 1999. Soon after, the SCA developed a cupping form that has been the industry standard ever since.

Nevertheless, due to the conflict in Yemen, the dwindling value of government salaries, lack of training, inadequate logistical support and poor motivation, actual implementation of quality control and assurance is rarely enforced. While some export markets may require some tests (usually chemical) to issue health certificates for import by receiving countries, thus inserting some quality control along the value chain, domestic markets require almost no tests, leaving the domestic consumer subject to lower quality coffee products, which may even pose health risks, and dependent on the client's own judgment of coffee quality. This may cause coffee prices to be artificially lowered because the quality evaluator is often the buyer him/herself.

For exports, the standard quality control and assurance procedure is to receive a health certificate attesting that the exported coffee is fit for human consumption, free of radioactivity and specific chemical contaminations and that the coffee was harvested properly. In other countries, these certificates are obtained from government laboratories in the main cities and at border inspection points (BIPs), but there are no such inspection points at the Yemen's land and sea borders at all.

Inspection by laboratories and BIPs is constrained by a number of issues, including: i) lack of basic equipment such as thermometers, balances, sample preservation and transport materials, etc.; ii) poor industry awareness, with government staff unresponsive to the nature of export-led processing and its particular requirements; iii) large gaps in human resource and skill capacity among government entities working in quality control, implementation, and practical laboratory operation; and iv) insufficient knowledge and understanding of coffee quality standards and the characteristics of Yemeni coffee beans and its DNA verification.

Until now, there has been no scientific study or research on the characteristics of Yemeni coffee varieties and their fingerprints. This contributes to the mixing of Yemeni and other coffees such that they cannot be differentiated by anyone but a very few of the the most seasoned experts.

The absence of the quality control and assurance measures renders Yemeni exporters unable to expand into new markets where such measures are more sophisticated, e.g. the United Kingdom of Great Britain and Northern Ireland and the United States of America. Because coffee quality is not checked, Yemen's institutions are unable to enforce quality and standardization. As a result, stakeholders across the coffee value chain (from farmer, to cooperatives, traders and processors) are disinterested in active quality control and assurance measures even though these would increase incomes by fetching higher prices for a better quality product and by decreasing losses.

It is important to encourage such farming practices such as: timing irrigation and fertilizing, pruning, and proper harvesting. Proper processing methods must be used with greater documentation provided to traders, who must take greater care to ensure that coffee is stored and sold in conditions adequate to maintaining quality and human health. Further along the value chain, transporters, especially within the domestic market, must adopt safer practices. Yemeni coffee is often transported in cars that are open and during daylight hours, contrary to best practices, i.e. coffee should be transported in the cold, preferably at night, and only in a closed truck.

Chapter VI

Photo by *FAO Yemen 2020*

Systemic constraints and upgrading opportunities

The coffee value chain faces structural, endogenous and exogenous constraints, which require mitigation to upgrade practices across the value chain as well as the national governance and policy framework.

6.1 Value chain systemic constraints and upgrading opportunities

From input supply, production, processing, and output marketing, to support services and the enabling environment, the coffee value chain is inundated by structural and endogenous constraints. Many of these can be mitigated with the right investments, policy reforms and technical assistance, even though the conflict and economic crisis will continue to wreak havoc on the coffee value chain and the agriculture sector (Chapter VII. Reform recommendations and investment entry points).

6.1.1 Input supply

One of the main challenges in the provision of inputs is the variability and volatility in supply and demand for inputs driven primarily by the currency devaluation and challenges in the import supply chains. One the one hand, input suppliers such as fertilizers, plowing tools, and irrigation equipment are dependent on the orders from coffee farmers and cooperatives, which have been battered by declining incomes from currency devaluation. At the same time, they are facing challenges in supplying imported raw material, which are purchased in hard currency. Although fertilizers should be organic from animal waste – as most old generation farmers know and practice – most of the input suppliers and some of the agronomists now market chemical fertilizers with claims that they are the best source of nutrition for coffee trees. This has affected the new generation of coffee farmers. Because most Yemeni coffee lands are terraced, the most suitable plowing tools are those that are handmade or the handy machine tillers. The latter, however, are more expensive, require engine repair and therefore a support structure of maintenance workshops, which are in turn contending with ever increasing operational costs (due to currency devaluation and breakup in import supply chain of spare parts, etc.) causing gaps in the value chain. Further supply volatility comes from the lack of a qualified local workforce specialized in farm management, including land rehabilitation and best farm practices with their required inputs, tools and equipment (suitable fertilizers, plowing tools, irrigation equipment, pruning tools). Other input challenges include the absence of irrigation tools, including pumps – especially solar pumps, because farmers often cannot access diesel – needed to pump water up from the valleys or wells to the terraces. The inability of farmers to invest in building rain water collection ponds and wells prevents them from accessing a major source for irrigation when it is needed during dry months.

6.1.2 Production

The primary challenge in the production phase is the poor understanding and implementing of proper farm management. Farm management starts with land management, irrigation management, farming practices, genetic diversity, crops variation, diversifying farm income from different sources, etc.

Most of Yemen's agricultural land is not owned but rented by farmers; the true owners often live in the city or even outside the country. The owner and farmer agree to a ratio for dividing the yield, based on laws of the village itself. In some villages, the yield is split evenly between owner and farmer, 50–50. In others, the farmer may receive one quarter of the yield, another quarter is used to cover expenses and the remaining 50 percent goes to the owner. This kind of semi-ownership makes it impossible for farmers to secure loans from banks and other finance institutions, which require the borrower to prove ownership of the land as a guarantee for the loan.

Irrigation management is one of the greatest constraints in Yemen for a variety of reasons. The best land for coffee in Yemen are terraces in the mountains and valleys. Farmers depend on the rainy seasons to water coffee trees but – without irrigation management – cannot capture and store rainwater safely, and have no access to reservoirs or dams for the dry months. Due to heavy rainfalls, which may cause flooding, farmers are helpless to protect their terraces from erosion. As climate change increases, it is imperative that farmers be better educated and trained on measures to prepare for heavy rain and drought, so they can both conserve rainwater for use in irrigation and prevent flooding (e.g. drainage).

The history coffee cultivation paints a clear picture of how proper farm management results in higher yields of better-quality coffee: exactly when soil should be fertilized, how and when trees should be pruned trees, best methods to prevent and control pests, plowing, etc. Yemeni coffee farmers must be better trained in these proven techniques. Currently, their farming practices either random or not updated to face the reality of climate change. For example, most Yemini coffee farmers do not prune because they mistakenly believe a larger tree produces more coffee cherries. However, pruning once a year – and at the right time – ensures more yield. Many do not fertilize their trees, or do so at the wrong time and with incorrect quantities per tree. This may be because they have no access to organic fertilizers generated from animal's waste, or because they do not know how to turn that waste into fertilizer, even resulting in human illness when the waste is handled improperly. Farmers irrigate their coffee trees randomly, based not on the trees' need but on the availability of the water source or fuel necessary to pump the water out of wells onto the terraces. Early or delayed irrigation of coffee trees significantly affects coffee quality. To prevent and control pests, farmers often use chemical pesticides that can damage the tree and soil, use authorized pesticides, or allow their coffee trees to die from the pest so it can be replaced with qat or another crop. Finally, farmers also wrongly assume that a year with high harvest volume is followed by a year of lower volume. In fact, when best farming practices are employed, farmers ought to have high production each year.

Crop variation is essential to ensure coffee is not farmers' sole source of income. Qat and coffee are the most commonly planted crops, with qat in the lead and expanding ever more onto land formerly planted with coffee. This is so for several reasons. While all coffee lands are suitable for planting qat, not all qat lands are suitable for coffee. Both have to be produced in commercial quantities to guarantee farmers sufficient income. Because coffee is a one-season crop grown on smaller pieces of land (terraces), operating expenses are high. Farmers can barely meet their loan payments and other expenses, and it is hard to save for unexpected future events or even expand their agricultural lands. While older Yemeni farmers once called coffee a treasure on trees because coffee trees require little maintenance, this awareness is lost on the younger generation. Another reason why Yemini farmers fail to vary their crops is the lack of financial support or loans from finance institutions. Yemen's financing institutions are unfamiliar with coffee practices and integrated farm management and they tend to favor funding solar energy systems only.

Within the upstream production side, cooperatives and associations, which act as a first stage aggregator of coffee harvests, have limited institutional and technical capacities. This renders them unable to provide effective support to farmers, traders and coffee processing

firms. In principle, cooperatives support farmers with a wide range of services, such as training, marketing, and facilities provision. But inadequate support from the government and the declining income from coffee farmers' membership fees means the cooperatives and associations are not providing the services they used to. This leads to a vicious cycle that is preventing the growth in production and the increase in revenue for everyone: farmers refusing to pay membership fees due to the lack of services, and cooperatives unable to help farmers for lack of income. This is leading to significant losses on both sides.

Another constraint to expanding coffee production in Yemen has been the lack of investment. There have been donor initiatives targeted at providing technical and asset support to coffee farmers, but most have failed because donors did not understand the real need in farm stage, and because those agronomists who specialize in coffee are inadequately trained by Yemeni universities. The lack of support from local authorities and investors' low risk appetite for long-term projects also contribute to the problem. The private sector, meanwhile, has never picked up on the real value of investing in coffee, primarily because of the high cost of investment, very high risks associated with the security situation, poor coffee farm management, and the long-term nature of coffee investments. No private sector company in Yemen has its own coffee farms, they buy their coffee from farmers or collectors.

6.1.3 Processing

Processing in the coffee value chain has two phases. The first phase applies to both the commercial and specialty sectors though with differing methods, assets, quality, and cost. Commercial coffee farmers pick their coffee cherries one to two times per harvesting season as opposed to multiple picking in specialty coffee (when the bean is at the right size and color). In harvesting coffee, farmer contend with two challenges: the cost of hiring labor for harvesting, and the decision on when and how many times to harvest. If picked too early – not as red cherries but as unripe yellow or orange cherries – farmers will lose out on the price of Qishr which will have an undesirable yellowish color. If picked too late, the coffee cherries are too dry, having lost their recommended degree of moisture. Given that the coffee has to be picked manually bean by bean, optimizing the cost of labor for harvest to the quality of coffee and the price it can attain is

Yemeni farmers dry their coffee cherries by laying them out on tarpaulins on the roofs of their houses, though this violates hygiene standards. Because there are no meters to measure the humidity level of the cherries, it is hard for farmers to know exactly when the cherries should be removed from under the sun and put into coffee sacks. These coffee sacks are often the same kind as those used for rice and sugar, which causes the coffee to lose even more moisture. Once filled, these bags are often stored improperly. All these incorrect methods are due the farmers' poor knowledge of coffee processing best practices and the high cost of needed assets.

For specialty processing, farmers pick only red coffee cherries and hand them over to the producing companies. Most of the time, these cherries are carted in plastic or iron baskets, which is lowers coffee quality. Transportation from farms to drying centres is often done via animals or motorcycles during daylight, further diminishing quality; it ought be transported only in closed vehicles during cold hours, i.e. at night. Workers and visitors often touch coffee cherries during the drying stage, negatively affecting quality. During the drying process, producing companies depend on their own teams from the city, having invested in their training and paying higher salaries during the harvesting season. Yet farmers could be trained to manage the drying centres and processing stage themselves. This would be less expensive and help raise farmers'

awareness of what it takes to produce quality coffee.

The second phase of processing consists of dehulling, sorting, packaging, and roasting. There are many mills in Yemen, most of them in Sana'a, but only a few are exclusively for coffee. Commercial coffee traders and millers often engage in dehulling practices that are not recommended. They wet coffee before dehulling; this is done to increase the weight and to secure a full half of the dried cherry's outer skin, called folqa Qishr, which fetches a higher price than broken or ground Qishr. What causes this unwanted break or damage in the Qishr is either the low moisture content of the coffee dried beans, or the miller itself dehulled the coffee incorrectly, using a process not prescribed for coffee beans. Meanwhile, specialty coffee should be dehulled only in coffee mills with the proper level of moisture. Commercial coffee traders tend to mill their coffees at any mill, seeking only the lowest price; specialty coffee traders do their milling exclusively at coffee mills, which costs more.

For packaging, commercial coffee is put inside any sack or jute bag, less often in plastic bags unless requested to be vacuumed. Specialty coffee has to be put inside plastic bags first (made mainly for beans in general, not for coffee in particular). These plastic bags are then put inside jute sacks to block light from interacting with the coffee. While this is more costly, it preserves the coffee's quality for a longer period of time. After putting coffee beans in the specialized plastic bags, some companies also request that they be vacuumed for extra preservation and to prevent oxygen from interacting with the coffee beans during transportation, shipment and storage. The vacuuming process is an additional processing step which is only applied in the commercial coffee when bagged in plastic.

Small, medium and large coffee processing firms in Yemen face a number of challenges that compromise their competitiveness. In addition to the higher operational costs affecting the whole value chain (higher fuel costs, lower number of professionals working in coffee, etc.), there is the high cost of processing itself.

Meeting international food safety standards is a major challenge for processing facilities hoping to export their products. Processing of specialty coffee must be done in accordance with SCA standards and those of the importing country. Commercial coffee, on the other hand, can be exported regardless SCA standards and less attention is paid to the requirements of the importing country requirements. Sometimes, that results in commercial coffee being damages and brought back to Yemen.

6.1.4 Output marketing

Coffee markets are highly competitive, both at the national and global levels. Traders and exporters compete based on the volume of production, the type of coffee they produce and its origin. While Yemeni coffee globally is perceived as specialty coffee, a majority of lower quality commercial coffee is marketed as first grade quality coffee and is sold at inflated prices, or mixed with non-Yemeni coffee beans and sold as Yemeni coffee. While on a few companies market authentic specialty coffee, the rest of the coffee exported or on the local market is either commercial coffee or mixed coffee marketed as specialty.

The random way of working is evident in coffee warehouses and stores, which do not meet quality standards. Even private sector entities rarely pursue business models based on value addition. At the global level, exporters prioritize moving a high volume of commercial coffee to neighboring markets such as Saudi Arabia, which buys more of Yemen's commercial coffee than its specialty product. Regional markets pay slightly more than domestic markets for Yemen's commercial coffee. So traders prefer exporting to those nearby markets, where quality is less of an issue. Higher-priced specialty coffee, however,

is beginning to reappear in markets such as the United States of America, Australia, Japan and others. Yet, the breakdown of supply chain routes and infrastructure due to the conflict and embargo makes it more difficult to export beans by air. This results in the deterioration in the quality and freshness of coffee beans, causing Yemen to miss out on what would otherwise be very lucrative markets precisely at a time when there is increasing international demand. Additionally, non-compliance with strict quality standards and other international standards has made it harder for commercial exporters to expand operations in existing markets such as European Union or grow new markets in the United States of America, which are the two largest markets for coffee exports. Understanding markets and where opportunities lie for traders remains a major barrier to entry or expansion.

6.1.5 Support services and enabling environment

Finding data and statistics on the coffee sector remains a major challenge, not only for researchers and government officials, but also the main value chain players, from farmers to traders and exporters. Without a digital information system to provide easily-accessible, detailed, up-to-date catch quantities and price information means that all stakeholders are working in the blind, especially policymakers. Data plays a major role not only to inform policy and investment decisions, but also in product monitoring. For example, while handwritten logs are kept at some government offices, there is no monitoring of the mixing process of Yemeni and non-Yemeni coffee beans that are to be sold as Yemeni coffee, and no authorization from the responsible agencies is given to mix the beans. This negatively affects the reputation of Yemeni coffee domestically and internationally.

This also highlights a major gap in government inspection and testing capacity, which is constrained by a number of issues, including: lack of basic equipment for its laboratories; poor industry awareness of standards on shipments of perishable products; and large gaps in human resource capacity, especially in HACCP implementation, microbiology and practical laboratory operations. Additionally, the coffee value chain lacks private sector players that could play an important role in branding Yemeni coffee, especially by providing third-party certification and implicit endorsement through cupping services that provide taste and quality feedback.

6.2 Macro-level constraints

Apart from specific constraints, macrolevel constraints further compound the pressure on Yemen's coffee value chain. A web of interlinked challenges continues to grow in a vicious cycle that makes doing business a difficult endeavor while heightening the risks for investment. Conflict, economic meltdown, food insecurity, natural disasters and climate change, together with health crises make the overall environment in Yemen inconducive for business, whether in coffee or any other value chain. Nevertheless, it is precisely those challenges that could be mitigated by investment in coffee to stabilize post-conflict areas, provide livelihood incomes, and boost food and nutrition security.

6.2.1 Conflict

After decades of war and conflict, the new cycle of conflict that began in Yemen in 2015 between rivaling factions vying for control of the government essentially divided the country into two regions: one dominated by the internationally recognized government based in Aden, which controls what was traditionally considered southern Yemen, and another government dominated by the Houthi movement and led by the Supreme Revolutionary Committee, controlling northern Yemen and based on Sana'a. The conflict has resulted in numerous deaths and casualties, with the Armed Conflict Location & Event Data Project (ACLED) reporting more than 144 773 deaths between 2015 and 2020. Additionally, since 2015, the conflict has displaced over 4 million people, primarily within coffee-producing governorates, making Yemen the fourth largest internal displacement crisis in the world. The conflict has been destructive in terms of direct violence as well as the indirect damage caused by economic collapse and the interruption of supply chains.

Apart from the human toll, displacement and destruction of infrastructure, the conflict has had severe implications on governance, resulting in a collapse of government services, the breakdown of government institutions and division in the lines of authority and reporting. Public institutions and social networks have been severely impacted and are on the verge of collapse, with government services almost dysfunctional due to dwindling financial resources, lack of capacity and a decayed government infrastructure. The division of the government between south and north, with de facto authorities controlling government institutions and infrastructure, and often setting conflicting and competing policies, has further weakened governance and created chaos for both the private sector and humanitarian and development partners working in the country. The breakdown of support services offered by the government has rendered the enabling environment counterproductive to the operation and development of the coffee value chain.

Additionally, the conflict has drawn regional countries into the war, escalating and protracting the conflict to date, with neighboring Gulf countries imposing an embargo on Yemen that has impacted all imports of input supplies as well as exports of coffee products.

6.2.2 Economic meltdown

Given the split in governments, Yemen has two central banks and two exchange rates for the local Yemeni rial. In the south, the Yemeni rial has been depreciating tremendously especially since 2021, losing around 36 percent of value year-on-year as the government in the south circulates more money in the economy to pay for services and salaries. In the north, the exchange rate has been relatively stable since late 2019, remaining around YER 600 per USD. Before the war, the rial traded at YER 215 per USD. Since the beginning of the conflict, the cost of the minimum food basket (MFB) increased on average by more than 20 percent year-on-year. In addition to prices, other macroeconomic challenges have further aggravated the economic situation, including: near depletion of foreign exchange reserves through ending external financial support, the reduction of dollar revenues owing to declining oil prices (during 2015–2020), and the reduction of remittances and increased cost of imports due to inaccessibility to the subsidized letters of credit that protect importers from exchange rate volatility. These factors all adversely affect household purchasing power, making coffee a luxury in Yemen, while increasing input costs for farmer households. While no accurate data exists for the coffee sector, the United Nations Development Programme (UNDP) estimates that at least 600 000 jobs have been lost since

the beginning of the conflict in 2015 UNDP, 2022). In 2015, 26 percent of businesses closed permanently due to the war. Agricultural production and fishing, employing nearly 70 percent of the workforce, has shrunk by a third. Businesses run by women have been the hardest hit with 42 percent closing. The World Bank estimates that economic output has contracted about 50 percent since the outbreak of conflict in 2015, and poverty has significantly increased with 52 percent living below the USD 1.90 a day in purchasing power parity (PPP) and 81 percent at a rate of USD 3.20 a day. (World Bank Group and World Food Programme , 2021)

6.2.3 Food insecurity

Yemen is considered not only the worst humanitarian crisis in the world, but also one of most disproportional and devastating development crises. Today in Yemen, around 20.7 million people out of 30.6 million, almost two out of every three Yemenis, need some form of humanitarian and protection assistance. Of these, 12.1 million people are in acute need. More than half of the population are facing acute levels of food insecurity, with cases of acute malnutrition among children under five at the greatest ever recorded. Most of the households with acute malnutrition are primarily located in coffee districts. The latest IPC analysis from January to June 2021 showed that the number of food insecure people in Yemen was 16.2 million people (54 percent of the total population) who were likely to experience high levels of acute food insecurity (AFI) (IPC AFI Phase 3 or above) (IPC Global Platform, 2022).

Households whose primary source of income is derived from agriculture and fisheries have been identified as being among the hardest hit by the ongoing situation in Yemen. According to FAO's monitoring of the impact of COVID-19 on the food security situation in Yemen, over one-third of surveyed households reported a decrease of more than 50 percent year-on-year in their main source of income in the second quarter of 2021, while 85 percent reported having incurred debts that they are unable to repay (IPC Global Platform, 2022).

Disrupted livelihoods and stifled income opportunities are increasingly diminishing the purchasing power of affected households, evidenced by the fact that traders have reported a reduction in the number of customers and an increase in requests for credit. The majority of households have been resorting to negative coping strategies in times of crisis in order to meet their immediate food needs, including borrowing money or buying food on credit; reducing essential non-food expenditures; and reducing expenses on agricultural, livestock or coffee inputs.

6.2.4 Health crises

Weak health systems and poor water, sanitation and hygiene (WASH) services, are already overstretched countrywide. The public health situation includes major prevalence of diarrhea, respiratory infectious diseases (pneumonia), malaria, dengue fever and diphtheria, in addition to malnutrition in coffee planting districts. Around 4.5 million people are estimated to be acutely malnourished, including 1.2 million pregnant and lactating women and 1.7 million children, out of whom 400 000 suffer from severe acute malnutrition (World Bank Group, 2017; cf. IPC Global Platform, 2022).

COVID-19 has made the health situation worse. Though, with an already shattered health system, spread of SARS-CoV-2 within Yemen has been largely undocumented and the

country's pandemic response has been muted. Nevertheless, the economic implications of the pandemic have been far reaching. Restrictions such as localized lockdowns and other prevention measures put in place by government authorities have affected food availability and access at household level. On the market supply side, the measures have generated supply chain delays (both in import and export), logistical barriers and market disruptions. Remittances have been worst hit by the COVID-19 pandemic, resulting in reductions ranging from a low of 20 percent to a high of 70 percent. Remittances constitute a significant lifeline for many Yemenis, especially rom Saudi Arabia where 62 percent of Yemeni expatriate workers are employed. Remittances are expected to continue a downward trend as Saudi Arabia repatriates Yemenis.

6.2.5 Natural disasters and climate change

Natural weather phenomena such as flooding and drought and other natural hazards such as desert locusts, further complicate an already difficult context. Although coffee production has been adapted to Yemen's arid climate, increasing water stress and unpredictable weather is affecting production. Flash floods and drought have had devastating effects, hampering farming activities and destroying coffee terraces in mountains and valleys, as well as increasing costs of irrigation on farmers.

6.3 Political economy of the coffee value chain

Apart from the endogenous systemic constraints in the coffee value chain and the exogenous macrolevel constraints, the political economy of the country trickles down to the coffee value chain, presenting an intrinsic constraint to its development. Four elements of the political economy of Yemen standout: 1) wealth distribution, inequality, and class; 2) regionalism; 3) markets and trade; and 4) corruption.

Resource accumulation along the coffee value chain is unevenly distributed, leading to an uneven distribution of wealth and inequality among value chain stakeholders, building social classes within the value chain that solidify barriers inhibiting the value chain. Being a labour-intensive endeavor, the value chain depends on the low wages and returns of farmers. Financial profit is accumulated downstream in the value chain, mostly by exporters. This is due to two primary reasons. The first is the class of traders, producers and exporters that have control over pricing, supply orientation (domestic versus export) and network (both domestic and in importing countries). Breaking into the trading and exporting class is not a straightforward process. Evolution from being an auctioneer and agent to trader requires good networks and connections across cooperatives, regions, and markets. The second is the inability of upstream stakeholders to add any value to their products, while simultaneously enduring asymmetry in market information and demand needs. Given that the majority of coffee farmers are stuck in subsistence mode, it is hard for them to look beyond making ends meet. The clear division between the social classes and unequal distribution of wealth, from the poverty-stricken farmers to the wealthier traders and exporter class, is an intrinsic constraint, but not entirely unique to the coffee value chain, as similar patterns are observed in other agrifood value chains.

Wealth distribution is further delineated by regions. Historically, the division between the north and south was based on sources of wealth and trade. Today, the governments in the north and the south recognize the economic importance of the coffee sector and its potential for generating income for both the public and private sector and for allies with connections to both governments. Today's policies are geared less toward developing and supporting value chain stakeholders, and more towards extracting rent for coffee exports.

The third element of the political economy that constraints the coffee value chain is connected to the international political economy of coffee. Yemen's coffee value chain stakeholders – primarily the wealthy class of traders and exporters, and also the governments – have been unable to attract global players in the coffee industry – traders, corporations and investors – to invest in Yemen. Without regional and global foreign direct investment (FDI) into the industry, and sans the formation of any strategic partnerships from coffee harvesting to processing, Yemen cannot realize its potential of being a viable world coffee trading country. What is more, conflict is not the only major risk factor preventing FDIs. Corruption, the lack of government capacity in attracting and retaining investment (e.g. its inability to provide investment guarantees), coupled with the lack of private sector initiative and inexperience in building partnerships and making use of multilateral investment facilities and guarantees, remain major obstacles towards attracting investment into the coffee value chain.

Stakeholders along the value chain consider corruption to be endemic to the cost of doing business. This cost is partially passed along the value chain and eventually transferred to the end consumer. Estimating the cost of corruption on the coffee sector and the whole value chain is difficult given its pervasiveness and variability, which depends on the stakeholders' ability to pay.

Chapter VII

Photo by *FAO Yemen 2021*

Reform recommendations and investment entry points

7.1 Previous and ongoing interventions and support

The coffee value chain has received minor investments in the past decades, with almost all projects supporting the coffee sector only insofar as it is embedded in larger agricultural or development projects. This has often resulted in the neglect of important information, capacity building, infrastructure, and marketing issues that affect the coffee sector. Most interventions have focused on capacity building for farmers or minor assets and input distribution, with almost no investments dedicated to improving input supply, processing, trading and exports (Table 4). Investment in the coffee subsector has been sporadic and overshadowed by emergency aid from the government and development organizations, largely revolving around: 1) technical policy assistance in the form of value chain studies and strategies; 2) investments in increasing the production of Yemeni coffee; 3) building the capacity of coffee farmers. No investments were directed towards downstream facilities and activities, which has limited the subsector's capacity to improve processing and commercialization of high-quality Yemeni coffee. One of the few investments made recently on the coffee value chain was the international coffee conference organized by SMEPs to link farmers and traders with the international players. The Arab Spring followed by the civil unrest that culminated in the 2015 conflict, has led the redirection of investment towards emergency aid. This has undermined the ability of capacity development projects to support the private sector to strengthen capacities, and setup the systems and infrastructure needed to add value in Yemeni coffee and increase exports.

Table 4. Highlighted projects and targeted coffee players in Yemen

	Coffee value chain players					
Donor/implementer	Farmers	Producers	Traders	Professionals	End market	Public sector
FAO: HiHI	X	X	X	X	X	X
SMEPS: Support Yemeni coffee farmers	X					
UNDP: Qat-to-coffee for climate resilience and human security	X	X	X	X	X	X
SPARK: ABC-Agribusiness creation	X					
ACTED: Make coffee not war	X					
USAID: Moving Yemen coffee forward	X	X	X	X	X	X
USAID: Cash for work programme	X					
USAID: Economic Recovery and Livelihoods Program (ERLP)		X	X			

Source: FAO and IFC elaborations for this report

7.2 Recommendations for reform areas and investment entry points

The overall goal of MAI's National Coffee Strategy (2019–2025) is "to increase the coffee production volume in Yemen and to elevate the quality of Yemeni coffee, training farmers and encouraging them to use modern technologies in coffee farming, water harvesting tanks, focusing on promotion and marketing of coffee through the establishment of marketing centres for coffee, and raising the productivity of coffee nurseries by rehabilitating the existing nurseries and establishing new ones to increase the coffee production from 18 000 of 50 000 tonnes by 2025." Under the government's plan, the overall strategic vision for the coffee sector was "to develop a producing, competitive, economically viable and environmentally sustainable coffee sector, which will deliver higher quantity and quality of coffee beans exported from Yemen to ensure social and economic benefits to communities (particularly alternative employment opportunities in rural and remote areas along the whole value chain with the focus on farmers)."

Building on the collective vision of the government and private sector actors, the objective of the proposed policy reforms and investment recommendations is to build a competitive and profitable coffee sector that can compete in international markets in terms of quality and value, offering attractive returns to value chain actors and stimulating reinvestment in the sector, largely through the adoption of modern and sustainable coffee farming practices and quality standards.

For better-functioning markets and to enable Yemen to manage coffee production in a sustainable manner, Yemen needs improved sector information and statistics, research, and improved coffee farm management plans with effective coffee monitoring, control, surveillance. In addition, infrastructure and institutional capacity needs to be overhauled to foster the growth of a modern coffee sector capable of producing and regularly supplying regular quantities of high-quality Yemeni coffee to export and domestic markets. This requires improved coffee harvest and post-harvest processes to provide a better quality product; the classification of Yemeni coffee beans to ensure that Yemeni coffee beans are not mixed with non-Yemeni coffee and sold as Yemeni coffee; and enabling government institutions with better governance and technical and policymaking capacity so they can support effective coffee research and resource management planning for the sustainable management and conservation of Yemeni coffee varieties. Finally, Yemen needs stronger financial institutions that are able and willing to invest in the coffee sector to expand sustainable production, upgrade post-harvest processes, and increase exports. The Table 5 below describes the main constraints and suggested interventions to increase the competitiveness of the coffee value chain in the country.

Table 5. Proposed key interventions in the coffee sector in Yemen

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
Input supply	Insufficient availability of coffee nurseries to produce high quality seedlings Limited adoption of organic fertilization (insufficient quantities of manure in coffee areas & limited knowledge of organic fertilization) High costs of farming inputs, tools, equipment & energy, which leads to increasing operational costs (due to currency devaluation, breakup in import supply chain of spare parts, & increased fuel prices) Limited supply of qualified local workforce (agronomists, nurseries' employees) specialized in seedling production (variety selection & preservation, hybridization, production of new varieties, fertilization, etc.). Absence of scientific tools & equipment to ensure purity of coffee varieties in coffee nurseries	High demand for quality seedlings justifies nursery owners' investment on capacity building, tools & equipment to improve nurseries' operations Most tools and equipment needed for nurseries, farming & processing can be manufactured locally	Increase farmer's access to inputs, equipment (including irrigation technologies) & training in seedling & organic fertilizer production through: Expanding the production of high-quality coffee seedlings adapted to the different agroclimatic conditions of Yemen's coffee-producing areas (includes scaling up research efforts & nursery operations) Mapping all coffee varieties by district, & training nursery technical staff on management of seedling varieties according to agroclimatic conditions Increasing livestock production in coffee areas & training coffee farmers in organic fertilizer production and application Scaling up training on new methods & technologies in nursery operations and input production at farm level Facilitating investments in inputs and equipment (including large investments for irrigation) through donor- and government-supported project grants for individuals & groups of farmers; increasing access to financing	Investment & TA

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
Production	Low productivity due to poor knowledge & adoption of good farming and management practices & technologies (irrigation, varieties, harvesting, post-harvest) Smallholders have limited investment capacity to expand coffee plantations, rehabilitate terraces, & invest in equipment & irrigation, largely due to their limited access to financial markets and institutions	The country has excellent agroclimatic conditions and high yield varieties that could be maximized through widespread adoption of good coffee production & post-harvest practices/ technologies Financial institutions can be educated about Yemen's coffee sector potential and risk-mitigation through adoption of sustainable practices, enabling them to create specific financial products for coffee (e.g. agri-insurance)	Scale up adoption of high-quality coffee varieties & improved farm management & production practices, including terracing, fertilization, moisture management & irrigation, intercropping, tree care, and harvesting, through the implementation of targeted technical assistance & training (e.g. farmer field school) training programs Increase farmers' access to financing to invest in modern coffee groves, rehabilitate coffee terraces, and irrigation infrastructure & technologies (including water harvesting & drip irrigation). This includes: (a) opening guarantee portfolios for financial institutions at Yemen Guarantee Loans so they can finance farmers easily; (b) providing capacity building for financial institutions on the coffee sector; (c) training farmers on financing & insurance tools; (d) assisting financial institutions in building farmers' credit histories to avoid need for collateral	Investment & TA

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
Processing	Small-scale coffee communities must play a greater role in managing, restoring, conserving & protecting coffee varieties, water resources, & ecosystems National and decentralized governments are still unable to empower & support coffee communities to engage in such participatory management (co-management) of coffee production areas Cooperatives are not fully functional & ill-equipped to provide the services demanded by members	Institutionalizing co-management of coffee production areas is crucial to give voice to small-scale farmers & contribute valuable knowledge (including indigenous knowledge) to the formulation of policies & regulations Cooperatives can be transformed into farmer–driven independent bodies that better represent members' needs & provide services that improve farmers' operations & profits	Promote & finance co-management of coffee production areas & activities through capacity building, creation of co-management mechanisms for integration of small-scale farmers, improvement of bodies representing farmers and other value chain actors Support existing cooperatives to: renew their visions & improve their governance, management & operations for the provision of necessary production, aggregation & storage, quality control, value addition & processing, & marketing support services for coffee farmers	Investment & policy

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
	Limited adoption of proper processing methods & techniques (husking, drying, roasting, packaging, storage, etc.) to elevate coffee cup quality based on international preferences, all largely due to knowledge gaps, inappropriate equipment & poor investment capacity Poor & costly transportation of green cherries & dried coffee beans due to security & high fuel prices Limited capacity to add value to processing methods that would minimize losses & improve quality	Local & international markets have enough demand to justify the local expansion of value-added components (better quality of dried cherries, roasting, Qshir, etc.), which would also lead to higher profits for farmers & other value chain actors	Create incentives and investment capacity for local investors & groups of farmers (use productive alliances, see below) to invest in value-added activities close to farming areas Provide capacity building for farmers and processors to improve coffee processing in accordance with international preferences, starting from the field Expand the capacity of agricooperatives to provide drying centres at village level & advisory services on value-added activities (processing methods, flavors customization, etc.) to coffee producers. Establish coffee hubs to provide coffee farmers, cooperatives, and traders with warehousing, milling, sorting, roasting and packaging facilities according to international standards, & classification of Yemeni coffee beans	Investment, TA

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
Output marketing	Since 2000, the reputation of Yemeni coffee has deteriorated due to mixing it with non-Yemeni coffee & mismatching between samples dispatched to importers & the coffee actually exported Exporters have been unable to enter new markets or increase exports to existing destinations, largely due to quality & logistic (low volumes) issues, but also because Yemeni coffee quality & taste are poorly understood and underappreciated (poor branding and marketing)	Yemeni coffee has many attributes (origin, social value, taste, environmental) that could strengthen messaging & branding efforts, targeting first the large Yemeni diaspora in some potential export destinations Coffee hubs and cooperatives can play an important role in increasing the volume of coffee available for export & funding branding & marketing efforts	Enhance Government of Yemen's capacity to promote coffee exports establishing specialized economic/agrifood attachés in target export countries Develop a geographic indication certification program for Yemeni coffee, e.g. 'Café de Colombia' or 'Jamaican Blue,' which are highly regarded in international markets Position coffee hubs and cooperatives to facilitate the aggregation of high-quality coffee products & channel them to export markets	Investment & TA
Support services & enabling environ-ment	Weak road infrastructure connecting main coffee areas with processing centres & ports; inadequate facilities dedicated to processing, storage, & packaging of coffee cherries	Farmers, cooperatives, & companies will be able to get their coffee easily & faster, which will connect more farmers with traders	Prioritize road rehabilitation & improvement programs focusing on roads connecting coffee production areas Fund investments to points of aggregation (storage & packaging) facilities in key coffee areas, create productive alliances that can receive financial support that would enabling cooperatives & groups of farmers to invest in these facilities	Investment

Value chain function*	Main constraint	Opportunity	Key intervention	Type of intervention (investment, policy, technical assistance [TA])
	Coffee sector statistics are very weak; data on areas of production, total production (yield), number of farmers and trees, varieties planted, volume consumed locally, consumer behaviors & preferences, etc., are outdated; export information is often inaccurate	Increased understanding of the coffee sector & behavior of local consumers through statistics & technical field studies can open opportunities to expand the sector, better positioning the government to enable investments & helping the private sector appreciate the potential return on investment	Conduct a study on the local coffee market in Yemen and consumer preferences Assist the government in building up an automated, online information system that is openly accessible & meets the diverse needs of various stakeholders along the value chain The Ministry of Agriculture Irrigation and Fisheries (MAIF) in southern Yemen should map coffee varieties and conduct a series of technical studies & surveys to collect production data from the field	TA
	Difficulties in coffee shipment (both as coffee samples or exported quantities), creating high transaction costs for exporters and delivery delays that often lead to loss of clients Transporters only ship coffee with containers; they do not provide services for samples (500 kg)		Via coffee hubs and coffee producer cooperatives, expand the aggregation of export-quality coffee products	TA & Investment
	Poor availability of well-equipped coffee testing labs owned & managed by private sector to ensure quality, reliability and sustainability of services (working as third-party quality control and assurance)	High demand already exists for certification services that would enable entry into high-value export markets	Improve laboratory equipment and enhance their capacities for service provision (processes, knowledge of standards, state-of-the-art testing techniques & HACCP implementation) Provide training for government technical staff on cupping, physical &chemical tests	TA (FAO and World Bank)

References

Chatham House (a.k.a. The Royal Institute of International Affairs). 2020. Yemen. In: Resourcetrade.earth. London. Cited 31 March 2021. https://resourcetrade.earth/

ACLED (Armed Conflict Location & Event Data Project). 2021, Dec 21). Research Hub: Yemen. In: ACLED. Washington, DC. Cited 21 December 2021. https://acleddata.com/research-hub-war-in-yemen/

FAO (Food and Agriculture Organization of the United Nations). 2022. FAOSTAT:Crop Production. In: FAO. Rome. Cited 21 March 2022.

ICO (International Coffee Organization). 2018. International Coffee Council 121st Session: Development of Coffee Trade Flows. Mexico City. https://www.ico.org/documents/cy2017-18/icc-121-4e-trade-flows.pdf

ITC (International Trade Centre ITC). 2021a. Customs tariffs, trade remedies, regulatory requirements for product exported from Yemen to the United Arab Emirates. In: Market Access Map. Geneva. Cited 31 October 2021. https://www.macmap.org/en//query/results?reporter=784&partner=887&product=03089000&level=8

ITC. 2021b. Export potential for Yemen. In: ITC Export Potential Map. Geneva. Cited 31 October 2021. https://exportpotential.intracen.org/en/products/analyze?fromMarker=i&exporter=887&toMarker=w&market=w&whatMarker=k

IPC Global Platform. 2022. Yemen: Acute Food Insecurity Situation January–May 2022 and Projection for June–December 2022. In: IPC. Bonn, Germany. Cited 1 July 2022. HYPERLINK "https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155479/?iso3=YEM" https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155479/?iso3=YEM

MAI (Ministry of Agriculture and Irrigation). 2022. Agricultural Data on Coffee. Sana'a. Unpublished data provided to IFC mission.

OEC (Observatory of Economic Complexity). 2022 Yemen. In: OEC. Cambridge. Cited March 31, 2022. https://oec.world/en/profile/country/yem

OEC. 2022a. Coffee. In: OEC. Cambridge. Cited March 31, 2022. https://oec.world/en/profile/hs/coffee

OEC. 2022b Coffee, tea, mate and spices. In: OEC. Paris. Cited March 31, 2022. https://oec.world/en/profile/hs/coffee-tea-mate-and-spices?redirect=true

OCHA (UN Office for the Coordination of Humanitarian Affairs). 2021. 2021 Humanitarian Response Plan Monitoring Report: Yemen, January – June 2021. . Retrieved from Reliefweb: https://reliefweb.int/report/yemen/yemen-2021-humanitarian-response-plan-periodic-monitoring-report-january-june-2021

Paulsen, Olaf. 2008. Breaking the vicious circle in coffee: Results from a Value Chain Analyses [sic] of the Coffee Industry in Yemen. Sana'a: GTZ (Gesellschaft für Technische Zusammenarbeit, a.k.a. German Society for Technical Cooperation). https://static1.squarespace.com/static/6006ff76e391125d24308c5c/t/605cd4fac229607ccfac7379/1616696575281/1.+GTZ_SMEPS+Breaking+the+Vicious+-Circle+in+Coffee+2008.pdf

The Queen Bean Coffee Company. 2018. The life of a coffee bean. In: Coffee with the Queen (blogpost of 23 January 2018). Cited 8 August 2022. https://thequeenbean.blog/2018/01/23/life-of-a-bean/

REACH. 2014. Coffee production assessment in Raymah Governorate – Yemen: Preliminary findings report, April 2014. Geneva: REACH. https://reliefweb.int/report/yemen/yemen-coffee-production-assessment-raymah-governorate-preliminary-findings-report-april

UNDP (United Nations Development Programme). 2022. Qat and Coffee Value Chain Analysis in Yemen. Sanaa. https://www.undp.org/arab-states/publications/qat-and-coffee-value-chain-analysis-yemen

USAID. 2005. Moving Yemen Coffee Forward: Assessment of the Coffee Industry in Yemen to Sustainably Improve Incomes and Expand Trade. Washington, DC. USAID. https://pdf.usaid.gov/pdf_docs/Pnadf516.pdf

USAID. 2013. Rediscovering Coffee in Yemen: Updating the Coffee Value Chain and a Marketing Strategy to Re-position Yemen in the International Coffee Market. Washington, DC. https://static1.squarespace.com/static/6006ff76e391125d24308c5c/t/605cd65445ca547a26f1a2ca/1616696927496/1.+USAID+Final-Report_Rediscovering-Coffee-in-Yemen_August-2013.pdf

USAID. 2019. Hameed's Harvest: Yemen's Coffee Farmers Brew New Hope from an Old Crop. In: USAID Archived Content. Washington, DC. https://2017-2020.usaid.gov/yemen/program-updates/oct-2019-hameeds-harvest

World Bank Group. 2009. Analysis of 5 value chains – Yemen: Fish, Honey, Coffee, Wheat and Qat. Washington, DC. http://www.value-chains.org/dyn/bds/docs/769/YemenValueChainsStudy.pdf

World Bank Group. 2015. The Republic of Yemen: Unlocking the Potential for Economic Growth: A Country Economic Memorandum (Report No. 102151-YE). Washington, DC. https://openknowledge.worldbank.org/bitstream/handle/10986/23660/Yemen00Republi00for0economic0growth.pdf?sequence=1&isAllowed=y

World Bank Group. 2017. Yemen Smallholder Agricultural Productivity Restoration and Enhancement Project. In: The World Bank. Washington, DC. Cited 7 July 2022. https://projects.worldbank.org/en/projects-operations/project-detail/P162659

World Bank Group. 2019. Overview of the Global Coffee Sector Supply Chain. Washington, DC. https://collaboration.worldbank.org/content/sites/collaboration-for-development/en/groups/agrifin/products.entry.html/2019/06/27/overview_of_the_glob-GoCm.html

World Bank Group. 2021a. Republic of Yemen Brief. MPO (Macro Poverty Outlook) 180: (April 2021). Washington, DC. https://thedocs.worldbank.org/en/doc/e75a6c6f3262f756492f3135709b2b01-0280012021/original/18-mpo-sm21-yemen-yem-kcm2.pdf

World Bank Group. 2021b. Yemen Food Security Response and Resilience Project. In: The World Bank. Washington, DC. Cited March 31, 2022. https://projects.worldbank.org/en/projects-operations/project-detail/P176129

World Bank Group. 2022. In: World Bank Open Data. Washington, DC. Cited 21 December 2021. https://data.worldbank.org/

World Bank Group & World Food Programme (WFP). 2021. The 2020 Food Security Crisis in Yemen. Washington, DC., World Bank and Rome, WFP. https://thedocs.worldbank.org/en/doc/92fc3af844649ba7ccefc7d5c88f4dfb-0280012021/original/mena-yemen-Food-Security-Crisis-sep21-eng.pdf

Appendices

Annex I. Ongoing and implemented projects, 2005 – June 2022

Name of the institution	Project/ program	Purpose/objective	Locations	Progress	Budget	
IFC/FAO	HiHI	Evaluate investment entry points for major value chains in Yemen	Yemen	December 2022	–	Policy reforms, technical assistance & project investments outlined for IFC & FAO
SMEPS	Support Yemeni coffee farmers	· Train farmers · Provide resilience grants to help affected farmers procure irrigation systems, agricultural inputs, drying beds · Support coffee farmers with water sources – harvesting tanks. · Support Bura'a & Talooq associations with financial and technical assistance, exposure visits, & link the Talooq association with internal & external specialty markets as well as exporters · Provide cupping courses & quality enhancement sessions	Bora'a & Talooq in Taiz	Closed 2015	–	· SMEPS increased awareness of the cultural value of coffee & the importance of: attracting young people to the industry, creating a competitive market for coffee, enhancing the reputation of Yemeni coffee in external specialty markets · Increased the number of certified coffee cuppers, thereby increasing momentum in the specialty coffee market because cuppers deal closely with farmers, collectors, & external market buyers, who consider certified cuppers as trusted sellers · SMEPS' considerable investment supporting women farmers – the primary workers on coffee farms – improved their understanding of various issues so they can be decision-makers in coffee farming households · Technical support to farmers & associations has significantly increased production & quality, increasing farmers' incomes & household livelihoods · Water harvesting tanks increased farmers' productivity

Name of the institution	Project/ program	Purpose/objective	Locations	Progress	Budget	
UNDP		Support improved climate security & boost employment in Yemen by piloting the transition from qat to coffee				Completed value chain analysis of qat production, focusing on the financial benefits & livelihood opportunities offered by the sector, with recommendations on how the coffee value chain can be promoted as an alternative Developed inclusive community plans for coffee production, including resource management practices Farmers' groups provided with necessary equipment & supplies to undertake a coffee production pilot
SPARK	ABC-Agri business creation	Farmer trainings & business development support	Haraz-Bani Isma'el	Closed in 2019	–	Farmers trained in operating farms as businesses
ACTED	Make coffee not war	Support coffee farmers in a war-torn country with some agricultural inputs to improve quality	Raymah	Closed in 2018	–	Fertilizers delivered for farmers' use on plantations
USAID	Moving Yemeni Coffee Forward	Assess Yemen's coffee industry to sustainably improve incomes & expand trade Increase production, quality and market access provided by the Coffee Quality Institute (CQI) Build capacity in the techniques & requirements of coffee tasting; improve understanding of the critical elements that determine coffee's value in high-end markets	Yemen	Closed in 2005	–	Developed selection criteria & intervention options in the industry for the short, medium and long term Developed traders' understanding of quality standards for exports

Annex II. Key respondents

Entity type	Entity name	Location	Response type
End market	ONA Consulting	Mexico	Online interview
	Boot Coffee Campus	United States of America	Online interview
	Mokha Route LLC	United States of America	Face-to-face interview
	Luxicon Coffee Lab	Malaysia	Online interview
	Counter Culture Coffee	United States of America	Online interview
	Mazaj Coffee	United States of America	Online interview
	Sheba Coffee Company	United Kingdom	Online interview
	Alliance for Coffee Excellence (ACE)	United States of America	Online interview
	Torch Coffee /China, United States of America	China	Online interview
	Qima Coffee Limited	United Kingdom	Online interview
	Bica Coffee	United States of America	Online interview
Technical support	SMEPS	Yemen	Face-to-face interview
	FAO	Yemen	Face-to-face interview
	UNDP	Yemen	Online interview
	SPARK	Yemen	Online interview
	MochaValley	Yemen	
	Pragma	Yemen	Online interview
Private sector (companies)	Sana'a Governorate Chamber of Commerce	Yemen	Face-to-face interview
	Federation of Chambers of Commerce	Yemen	Face-to-face interview
	Chamber of Commerce and Industry, Amanat Al Asma	Yemen	Face-to-face interview
	Mocha Rout Company for the export of Yemeni coffee	Yemen	Face-to-face interview
	Yemen National Company	Yemen	Online interview
	Mocha Mill	Yemen	Face-to-face interview
	Hajj Muhammad Ali Suwaid	Yemen	Face-to-face interview
	The Yemeni Company for Packaging Coffee and Food	Yemen	Face-to-face interview
	coffee shop	Yemen	Face-to-face interview

Entity type	Entity name	Location	Response type
	PARCH	Yemen	Face-to-face interview
	MOKHA KING	Yemen	Face-to-face interview
	Mujahid Foundation	Yemen	Face-to-face interview
	Alhamdani Mocha for Yemeni Coffee	Yemen	Face-to-face interview
	Al Emadi Trading	Yemen	Face-to-face interview
	Qima Coffee Company	Yemen	Online interview
	Khairat AlYemen	Yemen	Face-to-face interview
	Al-Hamasi for the production and export of coffee	Yemen	Face-to-face interview
	Bani Senan Agricultural Cooperative Corporation	Yemen	Sent response via Whatsapp
Agricultural associations	Saeed Ali Muhammad Awaj Saber	Yemen	Sent response via Whatsapp
	Fouad Al-Fadhli	Yemen	Phone interview
	Saleh Ahmed Saleh Al-Moalimi	Yemen	Sent response via Whatsapp
	Ibrahim Muhammad Ali Al-Mansoori	Yemen	Sent response via Whatsapp
	Habri Farms	Yemen	Sent response via Whatsapp
	Alruwad Association for Coffee and Honey Producers	Yemen	Face-to-face interview
	Abna'a Bura'a Agricultural Association	Yemen	Sent response via email
	Bani Sinan (multipurpose agricultural cooperative)	Yemen	Sent response via Whatsapp
	Hamzi Ali Hamzi Farms	Yemen	Sent response via Whatsapp
	The Nakhb Association	Yemen	Phone interview
Government	MAI	Yemen	Sent response via Whatsapp
	Faculty of Agriculture, Sana'a University	Yemen	Face-to-face interview
	Water and Environment Centre	Yemen	Face-to-face interview
Financial support agencies	Aman Insurance	Yemen	Face-to-face interview
	YKB	Yemen	Face-to-face interview
	Yemeni General Insurance	Yemen	Face-to-face interview

Entity type	Entity name	Location	Response type
	Yemen Loan Guarantee	Yemen	Face-to-face interview
	Tadhamon for Micro and Microfinance	Yemen	Face-to-face interview
	Al-Kuraimi Microfinance Bank	Yemen	Face-to-face interview
Companies & organizations that did not participate in the study	Al-Kaboos	Yemen	–
	Durar	Yemen	–
	Mocha Hunters	Yemen	–
	Peoples Coffee	Dubai	–
	Al-Amal Bank	Yemen	–