SUMMARY

Yemeni coffee is valued on international specialty markets and the Yemeni Ministry of Agriculture counts this sector as one of its area of potential growth, with the five-year goal of more than doubling production. Additionally, stakeholders from the private sector, both foreign and national (including producers), as well as various aid agencies – donors and implementing organisations – have also signalled their interest in the potential upgrade of Yemeni coffee production.

Coffee cultivation is a long-established agricultural activity in Raymah governorate, which potential is partly constrained by poor production practices compounded by difficult local conditions (e.g. limited access and precipitations), with overall negative impact on quality. Local farmers nevertheless displayed a clear motivation to work toward improving their practices toward the goal of improving the reputation of coffee from Raymah. In order to support decision-making and planning efforts needed to upgrade the local coffee chain, the required context-specific data was previously unavailable on three central themes to coffee production: 1. production practices; 2. water resource management; and 3. the respective roles of men and women in coffee farming.

To address this information gap, REACH conducted an assessment in four districts of Raymah governorate in Yemen, between January and April 2014. This report presents preliminary findings from this assessment which was carried out as part of the project led by ACTED and funded by EuropeAid: "Safeguarding rural food access in Raymah governorate: Building water resources management capacity and enhancing local incomes through coffee chain development". Focusing on the coffee sector in Raymah governorate, the project aims at reducing poverty and vulnerability to food insecurity through the development of the coffee value chain in Al Jabin, As Salafiyah, Kusmah and Al Jafariyah districts in Raymah governorate.

REACH’s assessment aimed to (i) refine the design, planning and implementation of the project, including specific uzlas of intervention; and (ii) provide key information on coffee production and how to strengthen the sector so as to contribute to decreasing local populations’ vulnerability. The preliminary findings will be complemented in the final assessment report by further analysis on the local watershed, land use classification, gender roles, and standards from the international market. Preliminary findings point to the following:

- **Greater surfaces of land were dedicated to coffee cultivation** than to cereals or qat, in particular in Al Jabin and Al Jafariyah districts.

- While coffee producers conduct **basic pre-harvest practices** across the four surveyed districts, these were **often inconsistent and poorly implemented**. Those in As Salafiyah district in particular appear to implement good pre-harvest practices (e.g. fertilisation) to a lesser extent than in other areas. In addition, improved irrigation practices were also found to be lacking among local farmers, with many not using the most economical, efficient and environmentally-friendly techniques.

- **Post-harvest practices** reported in the surveyed areas include some that are detrimental to produce quality, in particular with regard to cherry drying and cleaning, while others known to increase the value of farmers’ production, such as husking and grading, are barely implemented.

- Most coffee farmers were found to store their produce before eventually selling it, sometimes for periods of up to several months. This is in **discordance with the freshness requirement of the international market**, and is all the more damaging to farmers’ products and revenues considering the weak post-harvest practices they implement and the low storage conditions available.
• Regular water shortages significantly affect the livelihoods and living conditions of local communities and in such instances approximately half of the surveyed households resort to negative coping mechanisms such as reducing water use. In addition, most of those households relying on agriculture for their subsistence reportedly do not have any coping strategies to mitigate the effects such shocks.

• Constraints to local populations’ water access primarily include lack of proper infrastructure and financial resources to ensure their adequate maintenance, as well as inefficient water resource management. For instance, 11% of surveyed households pay fees for water access, and only a minority of them do so to formal water resource management entities, which likely reduces water productivity.

• There is a clearly gendered division of labour in coffee production, and in activities related to water access and use. Women’s decision-making role in coffee farming is limited and they do not participate in marketing at all, despite the fact that their contribution to production activities is widespread.

• In regards to water, men are the main responsible for water collection and usage for agriculture, while this is the responsibility of women at the household level.

Despite efforts in improving basic production practices, Raymah coffee production still suffers from limited yields and low quality coffee produce. Through this assessment, REACH found that these issues can be primarily attributed to the limited knowledge of pre- and post-harvest practices, for instance with regard to irrigation, as well as drying and grading of coffee cherries. This highlights an overall lack of awareness of the market’s requirements on quality, freshness and traceability of coffee among local farmers, a likely result of loose linkages between producers, and other stakeholders further down the coffee chain in Yemen, such as exporters.

Moreover, improving production and related practices will require significant changes in behaviours with regard to access to, as well as use and management of, local water resources both for agricultural and domestic usage, in order to increase water productivity and overall reduce local communities’ vulnerability to shortages.

Finally, decision-making and planning efforts geared towards upgrading the local coffee chain need to take into account two additional factors: the strong gendered division of roles determined by local socio-cultural norms and practices, as well as expectations from the range of actors involved in the marketing and sale in the Yemeni coffee value chain.

About REACH
REACH is a joint initiative of two international non-governmental organizations - ACTED and IMPACT Initiatives - and the UN Operational Satellite Applications Programme (UNOSAT). REACH’s mission is to strengthen evidence-based decision making by aid actors through efficient data collection, management and analysis before, during and after an emergency. By doing so, REACH contributes to ensuring that communities affected by emergencies receive the support they need. All REACH activities are conducted in support to and within the framework of inter-agency aid coordination mechanisms. For more information please visit: www.reach-initiative.org. You can also write to us at: geneva@reach-initiative.org and follow us @REACH_info.
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List of Acronyms

FGD  Focus Group Discussion
KII  Key Informant Interview
WUA  Water User Association

Geographic classification

Governorate  Highest form of governance below the national level
District  Administrative division below the governorate level
Uzla  Also called “sub-district”. Administrative division below the district level

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INTRODUCTION

Raymah governorate is affected by particularly high rates of chronic malnutrition (nearing 70%, the highest in Yemen), and also suffers from food insecurity (close to 55% of Raymah households are reported food insecure) and chronic poverty. Weak livelihoods and limited livelihoods opportunities are primary causes of poverty across Yemen. This is notably the case in the agricultural sector, especially in rural parts of the country such as Raymah where most of the labour force works in agriculture-related activities. Therefore, agricultural production is a key aspect of local populations’ food security. The sector nevertheless remains underdeveloped due to lack of maintenance of agricultural assets and infrastructure such as terraces and irrigation systems, as well as inadequate agricultural practices.

As a self-reinforcing phenomenon, weak livelihoods and correlated poverty levels contribute to communities’ vulnerability to food insecurity, which in turn affect livelihoods, notably when food insecure households resort to negative coping strategies such as purchasing food on credit (often informal). In addition, recurring unforeseeable shocks such as poor rainy seasons and rising fuel prices further contribute to weakening livelihood systems. In rural areas of Yemen such as Raymah governorate, where a transition toward development can be operated, strengthening agricultural livelihoods by increasing linkages between small producers and markets can bring about critical economic growth. This can in turn contribute to strengthening livelihoods and the resilience of local communities, eventually reducing their vulnerability to chronic threats such as food insecurity.

To address these issues in a sustainable manner, EuropeAid, ACTED and its local partner the Yemeni Women’s Union have partnered for the implementation of a three-year intervention in Raymah governorate that integrates a value chain approach to development, aiming at reducing poverty and vulnerability to food insecurity through the development of the coffee chain. Considered as one of the most important agricultural commodity, and second only to qat in terms of reliable income, Yemeni coffee have been particularly appreciated on foreign specialty markets such as Saudi Arabia, Japan, the US and Europe. As a result of this trend, stakeholders have displayed increased interest in the Yemeni coffee sector, including experienced national and international private companies and traders. In Raymah itself, farmers have also demonstrated a clear commitment to coffee production, as well as the ambition to put their governorate on the map of quality Yemeni coffee. Furthermore, the strategy of the Yemeni Ministry of Agriculture and Irrigation has integrated greater focus on productive value chains, including that of coffee – with the announced goal of increasing annual production from 20 to 50 thousand tons. Finally, several aid actors have brought in dedicated operational capacity to assist in the development of the coffee chain.

4 According to FAO statistics, approximately 36.8% of the economically active population of Yemen works in the agriculture sector.
6 For more information on this approach, see for instance Altenburg, T. (2007). Donor approaches to supporting pro-poor value chains, January 2007.
7 Experts have even highlighted the potential higher profitability of coffee over qat if properly managed. See IFAD (2010). Economic Opportunities Programme, Programme Final Design Report, 2010.
Domestically, Raymah coffee is reputed to be of relatively poor quality especially when compared to other famed varieties of Yemeni coffee such as the Harazi or Ismaili ones. Nevertheless, Raymah is a key player in coffee production in the country. This context raises questions as to the potential for bridging the gap between quantity and quality in an effort to upgrade the local coffee chain, and the consequences such a change could effect in terms of local livelihoods, vulnerability levels and development.

Although general information is available at the national level regarding the Yemeni coffee value chain and its efficiency, it is not specific enough to enable decision-making, planning and implementation of activities intended to facilitate the upgrade of the Raymah-specific coffee sector. In particular, very little data was available with regard to three themes directly related to the local coffee sector and its productivity:

(i) local farming and production practices including pre- and post-harvest behaviours;
(ii) availability, access to, and management of, water resources, as coffee is a relatively water-intensive crop and the whole of Yemen is faced by a looming water crisis; and
(iii) gender considerations and division of labour, as Yemen's deeply conservative socio-cultural environment may constrain women's contribution to the coffee sector.  

In order to fill this information gap and as part of its EuropeAid-supported intervention, ACTED mobilised REACH to conduct a detailed assessment on the Raymah coffee chain in order to determine the constraints faced by local coffee producers. The assessment was carried out between January and April 2014 in four districts of Raymah governorate: Al Jabin, As Salafiyah, Kusmah and Al Jafariyah.

The assessment benefited from the active participation of local communities, notably that coffee farmers in these areas, as well as of the crucial input of many stakeholders involved in various stages of the coffee sectors, including the Ministry of Agriculture and Irrigation, local traders and authorities.

This preliminary report presents the initial findings of field data collection, looking specifically at:

1. Coffee farmers’ cultivation and sales practices,
2. Local agricultural and domestic water use and management, and
3. Local gender considerations in labour division.

A final report will subsequently present further examination of women’s roles in coffee production and water management, expectations and requirements of the international specialty coffee market, as well as local watershed analysis and land use classification.

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METHODOLOGY

This section describes the methodology that was developed and implemented during the Raymah coffee production and water management assessment, including: (a) the multi-stage sampling strategy; (b) the data collection process, including an overview of data collection methods and tools; and (c) the representativeness and limitations of the data collected, taking into account challenges encountered throughout the assessment.

MULTI-STAGE SAMPLING STRATEGY

REACH utilised a multi-stage sampling methodology, which is briefly outlined below. This sampling methodology was chosen in order to avoid sampling bias.

Selection of Districts

The assessment was carried out in areas targeted by interventions which will be implemented by ACTED with funding from EuropeAid. Four districts in Raymah governorate were covered by the assessment: Al Jabin, As Salafiyah, Kusmah and Al Jafariyah. Please refer to Map 1 in annex 6, showing areas covered by the assessment and targeted by ACTED’s project.

Selection of Uzlas within Districts

Uzlas (or sub-districts) were chosen as the geographic unit of analysis in order to maximise the amount of potential beneficiaries while remaining at a measurable scale. Since water user associations will be established within the selected communities\(^1\), it is believed that this administrative unit will facilitate the establishment of these bodies. A total of six uzlas per district were selected using a simple metric which targeted areas with the highest opportunity to thrive in a coffee agriculture project.

The selection of uzlas was based on the 2001 agricultural census and 2007 statistical yearbook\(^2\), and took into account the following criteria: low qat production; presence of cereal production\(^3\); crop agriculture is more prevalent than livestock activities; concentration of coffee production per capita; presence of water infrastructures; highest percentage of available of arable land.

Selection of Households and Key Informants at Uzla-level

In each of targeted uzla, enumerators randomly selected households for assessment. Households were assessed in each uzla until the target sample size for the municipality had been reached. Households were selected by enumerators through a randomised field walk. Target numbers of surveys\(^4\) were allocated to each uzla based on the number of households present in each area. A total of 4,193 surveys were collected, with 2,007 farmers interviewed on their coffee production and practices, and 2,186 households interviewed on their water usage.

\(^1\) Site selection will occur at the uzla level, as opposed to the village level.
\(^2\) These documents provide statistical data for Yemen and are produced by the Government of Yemen.
\(^3\) The project aims at increasing communities’ food security. As such, it was considered important to target farmers that both cultivate staple crops intended to secure food and cash crops such as coffee.
\(^4\) The confidence level indicates the level of certainty that respondents’ answers are representative of the population, while the margin of error is the plus-or-minus variation with which the total population would provide the same answer. This assessment was conducted with a 95% confidence level and 10% margin of error.
MIXED-METHODS DATA COLLECTION

The assessment included three components of data collection and analysis: (a) review of secondary data; (b) key informants interviews; (c) coffee farmers surveys; (d) household-level surveys; (e) focus groups’ discussion with women; and (f) Geographic Information Systems (GIS) and mapping of all collected and analysed data. A total of 48 enumerators were trained to collect data for this REACH assessment. Divided in eight teams (two for each district), 24 were trained to collect data from coffee producers, while 24 were trained to collect data from households. Data collection was carried out between end of January 2014 and early April 2014.

Secondary Data Review

REACH team reviewed data related to scope of the assessment and made available by national bodies and local stakeholders as well as from a range of other national and international sources. The Secondary Data Review (SDR) informed the design of the data collection tools presented below. The SDR was also used during the data analysis phase to triangulate and contextualize data collected by enumerators in the field.

Key Informant Interviews

Key Informant Interviews (KII) with coffee traders were conducted to get a better understanding of the coffee value chain in Raymah. KII collected information on i) the coffee supply chain, ii) the traders’ scale of operation, iii) their purchase habits and iv) their relationship with suppliers and customers.

Coffee farmers and Household Surveys

Surveys with coffee farmers collected information on i) their activities and the range of crops they cultivate, or their main source(s) of income, ii) their practices in coffee agriculture, iii) the roles and responsibilities of women, iv) their behaviours in terms of sales and basic marketing, and v) their agricultural water usage. A households’ survey was also facilitated to gather information on i) households’ use of water, ii) the role and responsibilities of women in water management, and iii) households’ coffee consumption practices.

Focus Group Discussions

In addition, the Yemeni Women Union, ACTED’s partner for the project’s implementation, conducted two focus-group discussions (FGDs) with women in each district. These FGDs collected qualitative information on women’s roles in coffee production and water management, the challenges they commonly face, as well as their needs.

Photo: Interview of female households’ member on water access and use, Raymah governorate

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15 Focus-group discussions and surveys with traders have not been analysed as part of this preliminary report. Data from these sources will be presented in the final report.
Geographic Information Systems (GIS) and Mapping

The maps listed below were created using primary data collected through the assessment and satellite imagery provided by the United Nations Operational Satellite Applications Programme (UNOSAT) at the United Nations Institute for Training and Research (UNITAR). The maps are intended to be used as tools to inform the decision-making and planning of interventions in assessed areas within Raymah governorate. The maps are included in the annex 6 of the report.

Map 1. Raymah Governorate: Proposed Areas of Intervention
Map 2. Severe Water Shortages Affecting Households Several Times a Year
Map 3. Households’ Main Coping Strategies in Times of Water Shortages
Map 4. Severe Water Shortages Affecting Coffee Farmers Several Times a Year
Map 5. Coffee Farmers’ Main Coping Strategies in Times of Water Shortages

Table 1. Assessment Sample

<table>
<thead>
<tr>
<th>District</th>
<th>Uzlas</th>
<th># of coffee farmers surveys</th>
<th># of households surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Jabin</td>
<td>Aden</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Bani Alroon</td>
<td>81</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Al Thari</td>
<td>93</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Bedeg</td>
<td>75</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Gear</td>
<td>81</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Shaboon</td>
<td>83</td>
<td>81</td>
</tr>
<tr>
<td>As Salafiyah</td>
<td>Al Aslaf</td>
<td>43</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Bani Al Jaradi</td>
<td>85</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Bani Al Abdi</td>
<td>84</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>Bani Al Askary</td>
<td>104</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>Bani Nafee</td>
<td>96</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Al Domer</td>
<td>93</td>
<td>92</td>
</tr>
<tr>
<td>Kusmah</td>
<td>Al Dhabarah</td>
<td>94</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Yamen</td>
<td>105</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Al Magharem</td>
<td>102</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>Bani Mansour</td>
<td>75</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Al Bocah</td>
<td>90</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Salokah</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td>Al Jafariyah</td>
<td>Bani Saeed</td>
<td>106</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Bani Al Harazi</td>
<td>90</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Bani Nafee</td>
<td>73</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Bani Al Kazi</td>
<td>80</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Bani Al Kahoy Al Sharaf</td>
<td>83</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Bani Goadea</td>
<td>82</td>
<td>91</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2,007</td>
<td>2,186</td>
</tr>
</tbody>
</table>
DATA ENTRY AND ANALYSIS

Data collection was undertaken using the Android smartphone based Open Data Kit (ODK) platform. This tool significantly improves data quality by: (a) reducing human error as a result of loss of forms, data collection mistakes, and data entry mistakes thus improving the accuracy of collected data; (b) increasing the speed at which mapping products and analytical reports can be produced through reducing data cleaning time and removing the time for data entry; and (c) ensuring the protection of data as a result of completed forms being removed from the data collection tool upon upload to the centralised database.

Data collected by enumerators was subsequently validated by the team leader before being uploaded to the central database, after which a final data quality check was conducted by the GIS/Database Manager, who looked for duplication of names, surveys or data.

This report presents the initial findings from coffee farmers and households’ surveys. It primarily aims at describing coffee farmers’ practices in terms of coffee production and households’ water management practices. This preliminary report will be followed by a more detailed final report containing analysis of qualitative data collected through women’s FGDs and coffee traders’ interviews. The final report will also present satellite imagery analysis pertaining to water source availability and crop production. The final report will present a more comprehensive analysis of the local coffee value chain and households’ water management practices.

DATA REPRESENTATIVENESS AND LIMITATIONS

Data representativeness

The methodology used for this assessment allows for representativeness at the uzla level with a 95% confidence interval and 10% margin of error. The methodology was designed for the extrapolation of findings, thus enabling a generalisation of findings for both surveys on water usage and coffee production.

Limitations of the methodology

Three main limitations of the methodology for this assessment were identified:

(1) Due to time and geographical constraints, enumerators were asked to survey households close from the main road, thus not accessing remote households;

(2) Target numbers were not reached in three uzlas: Al Magharem (for the household survey), Salokah and Al Aslaf (for the coffee farmers survey);

(3) Although household-level surveys allow for data to be collected on large populations using limited resources, it restricts the reliability of the information collected as they are mainly conducted with men heads of households. To mitigate this bias, focus group discussions with women discussing topics on water usage and coffee production were also carried out in all districts.
This section comprises three sub-sections. First, it provides a comprehensive analysis on coffee cultivation and sales practices at the producer-level. Secondly, it details households’ water management practices and barriers they face in terms of water access, as well as coffee farmers’ irrigation practices and coping strategies in times of water shortages. Finally, it aims at explaining women’s role in both coffee production and water management.

**COFFEE CULTIVATION AND SALES PRACTICES**

This sub-section provides a profile of the assessment respondents' livelihoods, followed by an overview of coffee agriculture in Raymah governorate, and presents an analysis of local practices in regards before, during and after coffee harvesting, including sale practices and local value chain.

**Respondents’ livelihoods**

To investigate local farmers coffee production and sales practices, a total of 2,007 farmers were interviewed. The large majority of respondents (90%) were heads of their households and 92% were men.

The majority of households reported a variety of income sources, and only 19% declared to depend solely on their agriculture activities. Farmers in As Salafiyah district are the most vulnerable in terms of diversification of income sources, as the majority of households cited farming as their only source of income. This was especially true for households in Al Domer, Bani Nafee and Bani Al Askary uzlas. On the contrary, farmers in Al Jafariyah are the least dependent on agricultural income, compared to households in other districts.

The large majority (81%) of farmers reported hiring workers to work on their farms. This was found across all districts. Most of them (67%) hired between one to ten workers in the last twelve months. It is however unclear whether or not these farmers regularly work in coffee production, as they were not often mentioned as the executors of pre- or post-harvest practices.

Farmers devote on average 41% of their land to coffee crops, 39% to cereals and only 11% to qat production. They also reported cultivating vegetables, legumes, fruits and other type of crops, though to a much lesser extent. Details on crop cultivation for each district are presented below.

Figure 1: Average Percentage of Land Planted With Cereals, Qat and Coffee
It is noteworthy that in the uzlas surveyed in Al Jabin (especially in Bedeg, Aden, Bani Alroon and Al Thari uzlas) and Al Jafariyah (especially in Bani Saeed and Bani Al Kazi uzlas), coffee production occupies a significantly higher proportion of land than other crops. Even in As Salafiyah, although the vast majority of land appears dedicated to cereals, coffee still occupies more land than qat.

**Coffee agriculture**

In all surveyed districts of Raymah governorate, Tufahi, Dawairi, Udaini, and Bura’ai are the main coffee varieties grown, with Udaini being the least prevalent. These are believed to be the four oldest coffee landraces in Yemen, meaning that most of the coffee plants being cultivated in the country nowadays probably belong to one of these main varieties, including the renown Matari coffee (grown in Bani Matar outside Sana’a city), and Harazi and Ismaili coffees (both grown in the Haraz mountain west of Sana’a)\(^\text{16}\).

It is also noteworthy that these four varieties are Arabica coffee, which is considered as having a superior taste quality to other species such as Robusta for instance. The table below shows which basic production and geographical conditions are required to grow such varieties.

<table>
<thead>
<tr>
<th>District</th>
<th>Coffee Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Jabin</td>
<td>Tufahi</td>
</tr>
<tr>
<td>Kusmah</td>
<td>Bura’ai</td>
</tr>
<tr>
<td>Al Jafariyah</td>
<td>Bura’ai and Dawairi</td>
</tr>
<tr>
<td>As Salafiyah</td>
<td>Tufahi and Dawairi</td>
</tr>
</tbody>
</table>

**Table 2. Main Coffee Varieties Grown in Raymah**

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Production</th>
<th>Geographic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Udaini</td>
<td>Once a year</td>
<td>Up to 2,000 metres</td>
</tr>
<tr>
<td>Dawairi</td>
<td>Year-round</td>
<td>Up to 1,700 metres</td>
</tr>
<tr>
<td>Tufahi</td>
<td>Alternate year</td>
<td>Up to 2,000 metres</td>
</tr>
<tr>
<td>Bura’ai</td>
<td>Year-round</td>
<td>Up to 2,500 metres</td>
</tr>
</tbody>
</table>

**Table 3. Production and Required Geographical Conditions per Coffee Variety**

**Tufahi coffee** is widely found across all uzlas in Al Jabin district, as an average of 95% of coffee farmers reported cultivating it. It is also cultivated, though to a lesser extent, in As Salafiyah (51% of farmers), primarily in Bani Nafee and Al Domer uzlas.

**Bura’ai coffee** is mainly grown in Kusmah (77%) and in Al Jafariyah (71%) districts. While its production is widespread across all uzlas in both districts, Bura’ai coffee is less produced in Salokah, Bani Al Kazi, and Bani Al Kahoy Al Sharaf uzlas.

A majority of farmers from As Salafiyah (63%) and Al Jafariyah (61%) reported cultivating **Dawairi coffee**. Found across all uzlas, farmers in Bani Al Abdi, Bani Al Askary (As Salafiyah), and Bani Goadea and Bani Nafee (Al Jafariyah), are however less inclined to grow this variety.

**Udaini coffee** was the least reported coffee variety to be cultivated in Raymah governorate. It is mainly found in Al Jabin in Bedeg uzla (64%), in Kusmah in Yamen uzla (59%), and in As Salafiyah in Bani Al Askary uzla (58%).

A full analysis of qualitative data will be presented in the final assessment report explaining further buyers’ preferences for specific coffee varieties, as well as the characteristics of each variety (in particular water use).

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16 USAID, 2005, *Moving Yemen Coffee Forward*. There are reportedly more than 50 different types of coffee grown in the country.
Pre-harvest production practices

Maintenance

Overall, the findings from the assessment highlight that basic practices for maintenance of coffee trees were implemented by coffee farmers in all surveyed districts in Raymah.

Weeding is a crucial maintenance method as weeds compete with coffee trees for water and nutrients, and can be a source of pests/diseases. Most coffee producers across all districts reported weeding the area around their coffee trees (96%) and pruning/cleaning their trees on a regular basis (95%). Mulch is another good and common technique used by farmers to avoid the spread of tree diseases. Indeed, mulch not only prevents weeds to grow, but also preserves moisture in the soil, facilitates the penetration of rainwater, increase soil nutrient intake, and reduces soil erosion. Only a minority of farmers (28%) reported using stone mulch. Stone mulch is mostly used in Al Jabin (46%), Kusmah (32%) and Al Jafariyah (31%). It is however almost non-existent in As Salafiyah (2%).

Pruning/cleaning trees is also considered as an important maintenance method that not only acts as a barrier to pests, but also, if done properly, can increase trees’ yield by rejuvenating their stems.

Fertilisation is another crucial maintenance method which was found to be extensively used by farmers (84%). The use of fertilisers is more prevalent in Kusmah (98%) and Al Jafariyah (95%) districts. Producers in As Salafiyah (54%), however, are the least inclined to use fertilisers, especially in Al Aslaf (44%) and Bani Al Jaradi (33%) uzzals. This could be explained by a lack of resources, or may be attributable to a lack of understanding of fertiliser and its benefits. Fertilisation should be considered when designing training sessions on coffee cultivation. For instance, it is strongly advised to encourage the use of natural fertilisers, such as nitrogen, which is commonly used in other coffee producing countries. It can be found in some tree species or by using nitrogen-rich mulch. Advice from agronomists or coffee experts would be needed to know which species would be able to survive in the selected sites. When planted alongside coffee, such trees/plants could also provide shade to coffee trees, and thus additionally preserve soil moisture and slows the ripening process to improving the overall quality of coffee cherries and potentially increase yield. The use of natural fertilizers could also enable producers to market their coffee as an organic product. A certified organic coffee product from Raymah could find a niche market on the global market, and enable producers to demand higher returns for their coffee.

The majority of producers reported digging a trough around each coffee tree (81%) for irrigation purposes.

Main challenges faced by producers

The majority of farmers reported regularly suffering from low yield (66%), difficulties in access water (94%), high cost of labour (58%) as well as pests and diseases (96%). The practice of pruning/cleaning trees is often considered as a good barrier to the spread of diseases and pests, while fertilisers usually enable higher yields. It would therefore be recommended to train coffee producers on adequate maintenance techniques and methods. Producers, more specifically, in Al Jabin district are also significantly affected by high labour cost (73 %), which could be explained, by the fact that some harvest (and thus might hire) up to three times a year.

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20 Ibid.
21 Generally speaking, Arabica coffee trees are susceptible to a range of pests and diseases including fungi such as hemileia vastatrix (attacks the leaves), koleroga and coffee berry disease, as well as worms such as nematodes. More information on the pests/diseases reported as a threat in Raymah governorate will be presented in the final report.
22 Paulsen, O., GTZ, 2007. Breaking the vicious circle in coffee, Results from a value chain analyses of the coffee industry in Yemen.
In As Salafiyah, high prevalence of pests/diseases attacking coffee trees, lack of water or the old age of trees could be attributed to poor yields, which affects 47% of farmers in the district. Producers in Kusmah and Al Jafariyah reported facing many barriers affecting coffee agriculture such as high labour cost (66% and 88%), lack of access to credit (60% and 58%) in addition to pests/diseases and lack of access to water which as a result has led to poor yields (82% and 79% respectively).

Harvest practices

On average, 50% of coffee farmers reported harvesting once a year, and 45% twice a year. A small proportion in Al Jabin and As Salafiyah also reported harvesting coffee cherries three times a year. However, farmers often harvest both ripe and unripe cherries to sell higher volumes, even though this often reduces the quality of their supply. Therefore, the project will aim at highlighting the greater benefit of selling quality coffee over selling bigger quantities of lower quality berries, notably through the training offered to targeted producers.

Post-harvest production practices

Drying process

The drying process is one of the most important steps in coffee production as it directly impacts on the quality of the coffee beans. The large majority of coffee producers (86%) reported sun-drying their harvest by single layering them either on a roof or on cemented surface. However, 31% of Al Jabin’s farmers also reported sun-drying their cherries on a roof/cement, in several layers, without rotating them. While this might be seen as a faster method, a lack of rotation can cause fermentation or mould, and lead to uneven drying of the cherries. Furthermore, mixing clean cherries with unclean ones during the drying process can also contaminate the ripe cherries, and thus deteriorate the quality of coffee.

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23 Ibid.
24 Ibid.
25 Small Micro Enterprise Promotion Service (SMEPS) and The Royal Tropical Institute (KIT), 2009. Draft report, Analysis of 5 value chains – Yemen (Fish, Honey, Coffee, Wheat and Qat).
26 Such as soiled or rotten cherries.
Table 4. Drying Practices Used by Coffee Farmers

<table>
<thead>
<tr>
<th>Districts</th>
<th>Sun-dried on roof or cement. Coffee cherries on top of each other, not rotated</th>
<th>Sun-dried on roof or cement. Coffee cherries on top of each other, rotated periodically</th>
<th>Sun-dried on roof or cement, single layer</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Jabin</td>
<td>31%</td>
<td>4%</td>
<td>64%</td>
<td>0%</td>
</tr>
<tr>
<td>As Salafiyah</td>
<td>1%</td>
<td>11%</td>
<td>81%</td>
<td>7%</td>
</tr>
<tr>
<td>Kusmah</td>
<td>0%</td>
<td>1%</td>
<td>98%</td>
<td>1%</td>
</tr>
<tr>
<td>Al Jafariyah</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Total average</td>
<td>8%</td>
<td>4%</td>
<td>86%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Husking and sorting dried cherries

Husking usually follows the drying process and is a preliminary step to sorting and grading coffee beans. Husking dried coffee cherries is not a practice commonly employed by coffee farmers in Raymah. Only 7% of producers reported husking coffee cherries, mainly in Kusmah district, and in Salokah uzla. However, this practice is non-existent in Bani Al Kazi and Bani Goadea uzlas in Al Jafariyah district.

Overall, around 31% of coffee producers in Raymah reported sorting their coffee yield into an average of two quality grades. Grading coffee beans is an important step as it enables farmers to market the quality of their production to traders and wholesalers. This also responds to the global market’s requirements in terms of quality standards. This practice was mainly observed in Al Jabin district, in Bedeg (69%), Al Thari (56%), in Aden (55%) and Gear (51%) uzlas, as well as in Al Jafariyah district, in Bani Al Harazi (42%), and Bani Al Kazi (41%) uzlas. Producers in these districts thus demonstrate some awareness of the importance of grading their coffee products prior to sales. However, this practice is almost non-existent in Kusmah and As Salafiyah districts, especially in Salokah, and in Bani Nafee and Al Aslaf uzlas. This could be explained by the fact that a significant proportion of producers’ coffee yield is used for personal use and that farmers might not know how to generate high profit from graded coffee; as such the practices of husking and sorting cherries might not be seen as essential steps.

Storage of coffee

Around 47% of all coffee producers reported selling coffee immediately after drying it. This was mainly reported in Al Jabin district (88%) across all uzlas, where producers seem more aware of best practices in coffee production and market requirements for fresh coffee beans. This also could be due to the fact that Al Jabin district acts as a “commercial hub” at the district level, where major coffee markets are present. 46% of farmers in As Salafiyah also reported selling their coffee immediately after drying it. In contrast, producers in Kusmah28 district displayed less knowledge of the importance of selling their yield immediately after harvest and drying, and reported storing cherries sometimes for several months. Coffee farmers in Al Dhabarah, Al Magharem and Al Bocah in Kusmah district particularly, are more likely to store their coffee for a period of 1 to 3 months. In such areas, it can be assumed that coffee is mostly seen as a commodity to be sold only when the household needs liquidity. Farmers would thus benefit from training on market’s requirements and standard, which will raise their awareness on the benefits of selling fresh coffee and how it can bring them higher income.

28 40% of farmers from Kusmah reported storing their coffee between 1-3 months.
Coffee sale practices and local value chain

Coffee products sold

The majority of farmers reported selling coffee beans (74% of farmers), inner cherries (71%) and outer cherries (70%) called duka and qesher, while 13% reported selling other types of coffee products. Over 94% of farmers from Al Jabin, and especially those from Bedeg uzla (100%), reported selling coffee beans and (inner and outer) cherries. They are followed by As Salafiyah and Kusmah farmers.

Only 4% of producers reported selling beans and cherries in Salokah uzla (Kusmah). Such low percentage could be explained by two elements, i) there are very few coffee farmers in this uzla and ii) Kusmah farmers mainly seem to be orientated toward personal consumption of their coffee yield, possibly due to a lack of knowledge on the high profit they can get from coffee sales and/or due to their unawareness on how to access markets.

If coffee farmers are able to sell both the beans and the (inner and outer) cherries onto the market, it is because qesher (cherry peel) and duka (layer covering the green bean) are very appreciated in Yemen and used for infusion drinks\(^{29}\). While these drinks are almost only consumed in Yemen, it nevertheless enables farmers to trade their product as a whole, while still earning some income from turning into value what is often considered as waste\(^{30}\).

Selling habits

While producers overall tend to sell most of their coffee to wholesalers (34% of coffee in Raymah is sold to large scale wholesalers) or to keep it for their own personal consumption (28% of all coffee yield), their selling habits vary from one district to another.

**Figure 3: Use of Coffee Yields per District**

Al Jafariyah and As Salafiyah producers seem to be mainly orientated towards coffee production for both personal and commercial use. However, producers in Al Jafariyah also reported selling around 30% of their coffee in local markets. Those in Kusmah and Al Jafariyah districts mostly keep their coffee yield for personal use, at the exception of farmers in Al Magharem uzla (Kusmah) who reported selling more of their coffee yield to wholesalers than to keep it for personal consumption. On the contrary, Al Jabin’s producers are primarily orientated toward markets, selling most of their yield to wholesalers and to a lesser extent to local traders (particularly for farmers in Bani Alroon uzla). This could be explained by the fact that Al Jabin is a central local market place for traders and wholesalers in the coffee sector.

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\(^{29}\) Small Micro Enterprise Promotion Service (SMEPS) and The Royal Tropical Institute (KIT), 2009. Draft report, Analysis of 5 value chains – Yemen (Fish, Honey, Coffee, Wheat and Qat).

Access to market

About 39% of farmers reported going to markets once or twice per harvest, while 27% sell their coffee on a weekly basis during the harvest season. The latter is mainly observed in Al Jabin district, though it is almost non-existent in Kusmah, and more particularly in Yamen, Bani Mansour, Al Bocah and Al Dhabarah uzlas. This could be explained by the fact that most of the coffee produced in Kusmah is used for personal consumption.

The average length of farmers/customers relationship is 1.8 years. Those in Al Jabin reported doing business with their customers for an average of 2.9 years while those in Kusmah reported an average relationship of 1.2 years. This may be explained by the fact that Al Jabin producers seem more orientated towards commercial production unlike those in Kusmah. Coffee producers predominantly access coffee traders through seasonal visits to their local markets (36%) or when traveling outside of Raymah governorate (19%). The former was primarily mentioned by producers in Kusmah and in Al Jafariyah (especially those in Bani Goadea), while the latter was mostly reported by farmers in As Salafiyah district.

Coffee producers in Raymah also use their informal network to sell coffee, such as friends or neighbours (16%) or do business with traders who directly live in their community (14%). Those in Al Jabin revealed using both their formal and informal networks, using their friends/neighbours or doing business directly with traders in their villages. They also demonstrate a knowledge and resourcefulness in using formal directories or visiting local markets to sell their product.

This shows that informal networks play a significant role in small-scale value chain in Raymah governorate and should thus be strengthened throughout the project. Al Jabin producers also seem more aware and more capacitated in using all resources around them to trade their products, unlike farmers in other districts, which could be explained by the proximity of bigger coffee markets in the area.

Agricultural and Domestic Water Access and Use

In addition to asking coffee producers about their water usage for agriculture and irrigation practices, an additional 2,186 households were interviewed on their domestic water usage (84% of the respondents were men and 78% were the heads of their households).

Profile of respondents interviewed on domestic water use

22% of all households cited crop agriculture as their main source of income. This was followed by unskilled labour (19%) and livestock rearing (17%). Details per district can be found in the chart below.

Respondents were also asked about their households' other sources of income, which are detailed below. Households in As Salafiyah reported a higher average annual income, which may be attributed by the fact that many receive a military salary. At the uzla level, households with the highest income can be found in Bani Al Askary (average annual income of 851,609 YER) while those in Gear reported the lowest annual income (371,362 YER).

Finally, half of the household did not mention a third source of income. However, those who benefit from a third livelihood activity cited government remittances (13%), crop farming (11%) and livestock rearing (11%).

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31 This will further be analysed in the final report with the coffee traders’ interviews.
Unsurprisingly, most households reported taking part in agricultural activities. Around 49% declared participating in small-scale (subsistence) home-gardening activities, while 86% claimed taking part in large-scale farming activities. While this can be found across all uzlas, it is especially prevalent in Al Jabin and As Salafiyah, where households mostly rely on farming for income.

Table 5. Households' Main Sources of Income

<table>
<thead>
<tr>
<th>Districts</th>
<th>Primary livelihoods</th>
<th>Secondary livelihoods</th>
<th>Average annual income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Jabin</td>
<td>Crop farming, Livestock rearing</td>
<td>Government remittances, Unskilled labour</td>
<td>499,534 YER (≈1,706 EUR)</td>
</tr>
<tr>
<td>As Salafiyah</td>
<td>Crop farming, Military, Unskilled labour</td>
<td>Crop farming, Livestock rearing</td>
<td>737,766 YER (≈2,522 EUR)</td>
</tr>
<tr>
<td>Kusmah</td>
<td>Diversity of livelihoods, Unskilled labour</td>
<td>Crop farming, Livestock rearing</td>
<td>540,286 YER (≈1,847 EUR)</td>
</tr>
<tr>
<td>Al Jafariyah</td>
<td>Livestock rearing, Unskilled labour</td>
<td>Livestock rearing</td>
<td>497,535 YER (≈1,699 EUR)</td>
</tr>
</tbody>
</table>

Main barriers to water access

The main obstacles to water access reported by households are presented in the graph below. Overall, lack of water supply infrastructure was reported as a key constraint in this regard (65%), alongside sinking water table, which was reported across districts, albeit mostly in As Salafiyah (82%), especially in Bani Nafee (92%). In addition, households also stated being affected by poor resource management at the community level (37%) and lack of funds to properly maintain infrastructures (32%).

In addition to the above, it is of note that cost delivery was only mentioned by a very small minority of households across the targeted districts as a constraint in accessing water (around 5%). This may indicate that no system is in place in targeted areas to request users to pay for their water consumption, as is the case in many areas of Yemen, which in turn might result in resource mismanagement. This is an issue that project activities related to the establishment of water user’s association should look at tackling for instance through the training of these associations on water pricing and fee collection.
Already affected by frequent water shortages over the years, the households’ responses demonstrate that communities seem to have used most of their underground water stock, which has led to sinking water tables. Furthermore, Raymah being a mountainous area, water tends to flow down the valleys, preventing water tables from refilling. Communities are thus in need of training on water conservation and water management practices to avoid further depletion of groundwater and worsen their situation in the coming years. This is especially important if the scale of coffee production, a water intensive crop, is enlarged in the region.

Most communities in Al Jabin, As Salafiyah and Al Jafariyah will thus require the set-up of communal water infrastructures as well as training on management practices, both in terms of maintenance, access to credit and budgeting. These are particularly needed in all districts but Kusmah, which seems to already possess infrastructures and would mostly require management training.

Households Water Usage

Water access

The large majority (77%) use only one primary source of water for domestic purposes. Those in Al Jabin and Al Jafariyah are more likely to rely on one sole water source than those in Kusmah, which could be explained by the districts’ lack of water management infrastructures.

Out of the households mentioned above, 60% exploit natural springs, while 19% reuse rainwater and 12% resort to dug wells. Natural springs are mostly used in Al Jabin, while households in Al Jafariyah, and particularly those in Bani Al Harazi (57%), Bani Al Kahoy Al Sharaf (53%) and Bani Saeed (52%), reported collecting rainwater. Since most households depend on natural springs as their sole water point, households are thus highly vulnerable to both human-made (e.g. pollution) and climatic (e.g. drought) hazards affecting water supply. Diversification of water sources or at least proper maintenance of natural resources should be emphasised in interventions targeting the surveyed communities.

Those who reported using different water sources for drinking and domestic purposes cited natural springs (79%) as their main drinking source, and using harvested rainwater (73%) for domestic purposes. The latter is mostly found in Kusmah district, particularly in Al Magharem, Al Dhabarah and Salokah uzlas.
Respondents were also asked about their secondary water source. While most cited natural springs (68%) and harvested rainwater (26%), the latter is more prevalent in Kusmah district.

It is particularly surprising that only a minority of households reported collecting rainwater. It would be thus useful to further investigate whether this is due to a lack of awareness on water conservation practices, or if this is due to a lack of rain, which as a result makes the volumes of harvested rainwater insufficient to be reported as a sustainable water source. It is also interesting to note that while households in Al Jafariyah are likely to collect rainwater for domestic purposes, this is not the case of farmers. Differences in terms of practices would need further investigation. Farmers from Al Jafariyah could benefit from training on such conservation practices.

Reversely, awareness and implementation of water conservation (such as collecting rainwater) practices are widespread in Kusmah district. If Kusmah farmers/households’ knowledge on water conservation practices are confirmed, they could be involved in training on such practices with other communities in Raymah governorate. Women should be strongly encouraged to participate in training activities on water conservation, which could increase their role and voice in the communities. Finally, training on water treatment practices could also be beneficial to the communities, as most rely on water sources that present contamination hazards, and reports indicate that only a minority (3.6%) of households practice water treatment (mainly by filtration)\(^{32}\).

A minority (11%) of households reported paying a monthly fee to access water. This is predominantly observed in Al Domer (38%) in As Salafiyah district, Salokah (34%) in Kusmah and Bani Saeed (31%) in Al Jafariyah district. This practice is however, limited/non-existent in Bedeg, Al Thari, Aden, in Al Jabin district, Al Askary in As Salafiyah, Bani Mansour in Kusmah and Bani Al Kazi in Al Jafariyah. Out of those who pay a fee to get water, 40% use non-professional and non-commercial suppliers (such as neighbours) and 43% resort to other types of water providers. Only 6% cited paying a fee to a Water User Association, and mainly within Al Domer (34%). These households are thus vulnerable, since they seem to mostly depend on informal providers. As such, their ability to access water can be impeded if conflict arises with suppliers or if fees unexpectedly increase. These findings also show that Water User Associations are either non-existent in the region, or that they do not adequately collect fees from their members. There is a need for implementing or strengthening the management of Water User Associations in order to ensure a more equal and better access to quality water, especially for the most vulnerable households.

Frequency of water shortage and coping strategies

54% of all households have been annually affected by serious\(^{33}\) water shortages over the last 5 years (see Map 2 in annex), while 39% declared they had been affected by this issue several times a year. The latter is more prevalent in Al Jabin (70%), in Shaboon (84%), Bani Alroon (80%) and Gear (76%) uzlas, and in Al Jafariyah (60%). Households in As Salafiyah (86%) and Kusmah (78%) districts are more impacted by annual water shortages, especially in Bani Al Jaradi (100%), Bani Al Askary (91%), Salokah (88%) and Bani Nafee (88%). Households in Al Jafariyah also reported being impacted by annual shortages, though to a lesser extent (35%). It should also be noted that 56% of households in Aden and 18% of those in Bani Al Kazi declared not being affected by water shortages at all. It is unclear why these communities are less impacted by water shortages, and thus more investigation is required.

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\(^{33}\) Serious was defined as: “not enough water to fulfil all normal tasks, such as drinking, washing, and cooking, without sacrifices”.
When faced with water shortages, households resort to multiple coping strategies (see Map 3). As such, 68% revert to secondary sources of water, 26% restrict their water usage to essential needs, while 24% use less clean water in their daily routine. This not only puts a lot a pressure on natural water resources, such as springs, but also threatens the health of communities’ members, as a quarter may use unclean water for their daily chores.

In terms of water shortages affecting households’ agricultural activities, 69% of them reported having suffered from water shortage on an annual basis over the last 10 years. This is especially true in Kusmah district, in Al Dhabarah (87%), Bani Mansour (82%) and Al Bocah (80%) uzlas, and in Al Jabin district. However, 86% reported having no coping strategies, endangering their agricultural activities which, for most households, represent their primary source of income.

Households are thus highly vulnerable to water shortages, whether for their domestic and drinking uses or for their agricultural activities. While most have access to one or more coping mechanisms when facing shortages of drinking water, the large majority remain vulnerable when shortages affect their livelihoods. Households could thus highly benefit from awareness-raising sessions on water conservation methods. Furthermore, the project should also encourage households and farmers to diversify their water sources in case of water shortages.

**Agricultural water usage and irrigation practices**

**Water shortages and coping mechanisms**

71% of coffee farmers in Raymah governorate declared suffering from severe water shortages several times during the coffee growing season. Severe water shortages occurring several times a growing season are present in all districts across the governorate, mostly in Al Jafariyah district (Bani Goadea particularly), Kusmah and Al Jabin. However it is worth noting that those in As Salafiyah are equally affected by both annual (50%) and severe34 (43%) water shortages happening several times a growing season (see Map 4).

The majority of coffee producers (62%) do not have any strategy in place to cope in times of water shortages (see Map 5). 25% only reported irrigating their cropland less, and 11% purchasing water from external sources. These two strategies are mainly found among households in As Salafiyah. Those in Al Jafariyah, in Bani Al Harazi and Bani Saeed uzlas, as well as those in Al Jabin, in Shaboon and Bani Alroon uzlas, are the ones with the least coping strategies and are thus particularly at risk.

**Irrigation practices**

Only a small proportion (34%) of coffee farmers reported irrigating their crops. However, those who irrigate their crops, often water a small proportion of their land35. This is not surprising considering the severe and frequent water shortage experienced in Raymah. Farmers in As Salafiyah, particularly in Bani Al Abdi and Al Domer, and in Kusmah, such as Bani Mansour, are more likely to water their crops than those in Al Jabin and Al Jafariyah. Irrigation practices are non-existent in Al Harazi, Bani Nafee, Goadea and Bani Saeed for example.

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34 Severe was defined as “affecting profitability of (your) crops”.
35 On average, farmers irrigate only 36 % of their whole land, across the four districts.
Out of those who irrigate their crops, 51% reported using sprinkler irrigation, and 35% flood irrigation as their primary method. Sprinkler irrigation was found to be used across all districts but As Salafiyah. Bani Mansour, Al Dhabarah and Aden are the uzlas where sprinklers are mostly used. Flood/surface irrigation method can be mainly found in As Salafiyah district, especially in Bani Al Abdi and Al Domer uzlas.

Out of those who reported irrigating their crops, only 11% have more than one irrigation system. Most of them are located in As Salafiyah district, mostly in Al Domer, and in Aden in Al Jabin. No farmers in Bani Alroon, Bedeg (Al Jabin district), Yamen, Salokah (Kusmah district), Bani Saeed, Bani Al Harazi, Bani Nafee, and Bani Goadea uzlas (Al Jafariyah district) reported using a second irrigation system. Flood/surface irrigation and sprinklers were the most cited second irrigation practices used by farmers.

Considering water shortages and climatic conditions in Raymah, flood/surface irrigation might not be seen as the most effective irrigation method; it also requires precise management techniques to be used efficiently or it can then present important risks for the soil and the crops (e.g. waterlogging). The use of flood/surface irrigation however indicates that farmers probably lack awareness on more adequate irrigation techniques (e.g. drip irrigation) which would be more adapted to Raymah’s weather and geographical conditions and which would be more efficient and environmental friendly.

Springs (49%), drilled wells (22%), and above-ground storage tanks (16%) are the main water access points used by farmers who irrigate their crops. Springs are mostly used by those in Bani Al Askary (Al Salafiyah), Aden (Al Jabin) and Bani Al Kazi (Al Jafariyah). However, drilled wells are the main water points for farmers across As Salafiyah district, although they are not used by farmers in Al Jabin and Al Jafariyah.

Only 22% reported using an outside water source (i.e. a water source that is not on their property). This is predominantly observed in Bani Al Abdi, Al Domer (As Salafiyah district) and Salokah (Kusmah district) uzlas but is non-existent in Al Harazi, Bani Nafee, Bani Goadea (Al Jafariyah), and Bani Alroon (Al Jabin district) uzlas. Private wells (30%) and other infrastructures (32%) were the most cited outside water sources used by farmers.

Only 24% of all farmers harvest rainwater. This is predominantly the case in Kusmah, such as in Bani Mansour and Salokah uzlas and in Al Thari uzla (Al Jabin). This practice is however very limited in Al Jafariyah, and non-existent in Al Harazi, Bani Nafee, Bani Goadea uzlas, where farmers might lack awareness on the benefit of such practice. Reports indicate that Raymah governorate receives between 300-500mm of annual rainfall, and as such the further development of rainwater harvesting systems appears as an option to increase water availability in the targeted areas.

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LOCAL GENDER CONSIDERATIONS IN LABOUR DIVISION

This sub-section outlines gender roles in both coffee production and water management at the household level. It focuses on women’s roles in decision-making and implementation, and details their crucial involvement in pre and post-harvest practices as well as in water collection and management.

Gender roles in coffee production and sale

As per Yemeni traditions and conservative socio-cultural norms, women play an important role in maintaining coffee trees, although they overall lack decision-making power with regard to coffee production. It is interesting to note, however, that women in Kusmah district seem to enjoy slightly more decision-making opportunities, especially regarding the use of fertilisers. This distinctiveness on women’s role in Kusmah will be further investigated during the project.

Pre-harvest practices

Decisions regarding pruning/cleaning trees are essentially taken by adult men, while both adult men and women participate in the activity equally across all districts. However, Al Jabin is an exception, where pruning is predominantly done by adult men and hired labour. Further investigation on Al Jabin’s distinctiveness in terms of division of labour will be carried out during the project.

Adult men usually also decide on fertilising practices. It is however interesting to note that women account for 46% of the decision-makers in Kusmah district, especially in the uzlas of Al Magharem, Yamen, and Al Dhabarah. The qualitative reasons for this should be further investigated, as it may be useful as a basis for the enhancement of women’s opportunities in other parts of the coffee sector or in other targeted areas. In terms of fertilisation, overall, roles are relatively equally distributed between men and women: the activity is done by both adult women and men. In Kusmah and Al Jafariyah, however, women were cited as being the primary agents for applying fertilisers, while in Al Jabin fertilisers are mostly applied by men over 16 and hired workers.

Figure 6: Percentage of Coffee Producing Households Involving Women in Decisions and Implementation
Harvest and post-harvest practices

Adult men are the main decision-makers in terms of harvesting and share the task of picking up the cherries with adult women. However, the latter appeared less commonly involved in harvesting activities in Al Jabin, where half of the farmers reported paying labourers to pick up coffee cherries. It should also be noted that children (under 16) tend to participate in harvest activities, mostly in As Salafiyah and Kusmah districts.

Decision-making related to cherry drying is predominantly done by adult men (83%), while women are not involved in it apart to an extent in Kusmah and in As Salafiyah. However, women play a central role in the drying process, which often happens with the private environment of their home and therefore is likely to be considered more suitable for them. Indeed, 87% of farmers explained that adult women are the ones who dry coffee cherries. 77% also stated that adult men nevertheless participate in the process alongside children, especially young girls (under 16), while farmers in Al Jabin reported employing workers to dry coffee.

Among the few coffee-producing households who reported husking dried coffee, decisions about the process are mostly taken by both adult men and women, while the latter are the ones actually implementing most of the activity. As an activity that can take place at home and does not require much physical strength, husking is likely seen, as drying activities, as a more socially acceptable activity for women.

It should also be noted that, as per traditional socio-cultural norms, women play no part in the sales process of coffee, and both decisions and implementation of small and large scale sales are done by adult men.

Gender roles in water collection and usage for agriculture and domestic use

Women, whether adults (87%) or young girls (42%), are the ones chiefly responsible for water collection. To collect water, they have to travel an average 1.4 km, which takes them approximately 43 minutes. As such, any training aimed at increasing women's economical role in local coffee production should take into account women's traditional chores, and avoid adding extra burden on their shoulders. The implementation of efficiently run WUAs responding to communities' needs could also potentially reduce the time women spend fetching water.

For house-related chores requiring water, such as home-gardening, adult women are the main decision-makers (54%) and agents in charge of implementing irrigation practices (57%). Female decision-makers can mostly be found in Bedeg uzla (81%) of Al Jabin, and Bani Al Jaradi uzla (81%) of As Salafiya. Adult women (52%) are also the main decision-makers for other domestic water related uses, though 24% of households said that no-one consistently fills that role, and 21% reported adult men as the ones making decisions.

With regard to agricultural irrigation practices, adult men were found to be both the decision-makers (41%) and the ones in charge of collecting water (40%). They are again the main decision-makers (35%) for the maintenance and repair of irrigation infrastructure, as well as those responsible for the implementation of these activities (35%).
CONCLUSION

This report presents preliminary findings from the field survey conducted by REACH as part of a project led by ACTED and funded by EuropeAid: "Safeguarding rural food access in Raymah governorate: Building water resources management capacity and enhancing local incomes through coffee chain development". Focusing on the coffee sector in Raymah governorate, the project aims at reducing poverty and vulnerability to food insecurity through the development of the value chain in the four districts of Al Jabin, As Salafiyah, Kusmah and Al Jafariyah.

For this purpose, the assessment carried out by REACH had the two-pronged objective of (i) refining the design, planning and implementation of the project, including specific uzlas of intervention; and (ii) providing key information on coffee production and how to strengthen the sector so as to contribute to decreasing local populations’ vulnerability.

The assessment has found that most basic maintenance practices are implemented by farmers, although it does not prevent them from being affected by low yield and producing mediocre quality coffee. Producers have recognised the need and shown their eagerness in changing/updating their current production and irrigation practices. Training sessions could therefore build upon farmers’ traditional knowledge while introducing them to newer and modern methods, such as environmental friendly and economic irrigation systems.

Post-harvest practices tend to be the weakest link in coffee production at the farm level. Most producers lack awareness, equipment or incentives to invest in such practices, leading them to miss higher return on their production. Those who implement post-harvest practices often reported using improper techniques (such as not rotating drying cherries or storing them for too long), thus contributing to deteriorating quality instead of improving it. Women, who already play a crucial role in maintenance and processing should be further encouraged to take a more active role in coffee transformation, as a way to strengthen their role and visibility in coffee production and in the economic realm in general.

Water is also a crucial element for agricultural activities, and especially for coffee culture. In a region like Raymah, where both households and farmers reported suffering from severe water shortages, the establishment of an effective and sustainable water management system is crucial in order to reduce pressure on already depleting resources. As such, locally governed bodies may play a significant role in preserving water sources and distributing water equally among community members.

The assessment has also shown that only a minority of households and farmers tend to reuse rainwater for their domestic and agricultural purposes. Considering Raymah’s climatic conditions, the implementation of training sessions on water conservation practices may greatly benefit households, and lessen women’s burden in terms of water collection. Finally, water committees should draw upon women’s experience in managing water usage at the household level and actively engage them in managerial roles.

Developing coffee production in Raymah thus represents an opportunity for farmers to strengthen their livelihoods and resilience to food insecurity. While farmers are the first and more important actors to target in the chain, other actors such as traders would also benefit from training (notably on coffee processing) in order to ensure that producers’ efforts to grow quality coffee are not lost down the value chain. Furthermore, while improving production practices represent an essential first step, Raymah’s coffee will also greatly benefit from strengthened linkages between producers and markets. As such, traders but also consumers also need to be made aware of Raymah producers’ efforts and ambition to put their product on the map of quality Yemeni coffee.
## ANNEX 1: KEY INFORMANT INTERVIEWS WITH COFFEE TRADERS

### YEMENI COFFEE TRADERS’ QUESTIONNAIRE FOR KEY INFORMANT INTERVIEWS

**MARCH-APRIL 2014**

### Respondent information

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<tr>
<th>Name of surveyor:</th>
<th>Date of interview:</th>
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<tr>
<th>Name of respondent:</th>
<th>Gender:</th>
<th>Age:</th>
<th>Main occupation:</th>
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If you have a second other occupation, please specify:  
Telephone number:

### Interview location:

- a. Bajil
- b. Al Mansuriyah
- c. Hajjah
- d. Al Rebat
- e. Other (specify)

### Supply Chain Actor Information

1. **Who do you primarily buy coffee from?**  
   **Rank top three suppliers (1= main supplier)**
   
   - a. Coffee farmers
   - b. Coffee cooperatives
   - c. Coffee Local trader (uzla level)
   - d. Coffee District level trader
   - e. Coffee Regional trader (governorate level)
   - f. Coffee wholesalers Regional trader
   - g. Coffee wholesalers National level
   - h. Other (please specify)

2. **Where do you buy coffee from? (check all that apply)**
   
   - a. Directly from the farm
   - b. Local (uzla) market
   - c. District market
   - d. Bajil
   - e. Al Mansuriyah
   - f. Al Rebat
   - g. Other (please specify)

3. **Who do you primarily sell your coffee to?**  
   **Rank the top three customers (1= main customer)**
   
   - a. Local coffee trader (uzla level)
   - b. District level coffee trader
   - c. Regional coffee trader (governorate level)
   - d. Regional coffee wholesaler
   - e. National level coffee wholesaler
   - f. Governorate level retailer
   - g. National level retailer
   - h. Individuals
   - i. Exporters
   - j. Other (please specify)
Coffee Production Assessment in Raymah Governorate, Yemen – Preliminary Findings – June 2014

4. Where do you sell coffee? (check all that apply)
   a. Local (uzla) market
   b. District market
   c. Governorate level market
   d. Regional market (e.g Bajil)
   e. I sell nationally in Sana’a
   f. I sell internationally, in the Gulf region
   g. I sell internationally, outside of the Gulf region

5. What is the main way you transport coffee from suppliers to your office/customers?
   a. Plastic bags that I also use for transporting other goods
   b. Jute bags that I also use for transporting other goods
   c. Plastic bags that are only used for coffee transportation
   d. Jute bags that are only used for coffee transportation
   e. Other (please specify)
   f. I do not transport coffee

Processing

6. How long (on average) do you store coffee for before you sell? (in months)

7. What do you do to the coffee product before sale? (check all that apply)
   a. Dry coffee
   b. Separate coffee products into various grades
   c. Separate cherry from bean
   d. Grind coffee
   e. Roast coffee
   f. Add spices
   g. Package coffee product
   h. I do not process/alter coffee
   i. Other (please specify)

8. Do you mix coffee with other varieties/from different origins?
   a. Yes
   b. No

9. If you separate the coffee cherry from the bean, do you also sell the cherry?
   a. I do not separate the coffee cherry from the bean
   b. I buy only coffee beans, no coffee cherry
   c. I separate the coffee cherry and sell the bean and outer cherry (qesher)
   d. I separate the coffee cherry and sell the bean and inner cherry (duka)
   e. I separate the coffee cherry and sell the bean and both inner and outer cherry
   f. I separate the coffee cherry, but only sell the coffee beans

Volumes and margins

10. Approximately how much coffee did you buy in the last 12 months? (kg)

11. On average, how much did you pay for a kilogram of coffee from Raymah in the last 12 months? (in YER)

12. Approximately how much coffee did you sell in the last 12 months? (kg)

13. On average, how much did you sell a kilogram of coffee from Raymah for in the last 12 months? (in YER)
Location / Scale

14. Where are most of your suppliers based? (select one)
   - One village in Raymah
   - Many villages in one uzla in Raymah
   - Many villages in many uzlas in one district in Raymah
   - Many villages in many districts in Raymah
   - Districts in Raymah and districts in the surrounding region
   - My suppliers come from all over Yemen
   - My suppliers come from Yemen and internationally

15. Where in Raymah does your coffee come from? (select all that apply)
   - As Salafiyah
   - Kusmah
   - Mazhar
   - Jafariyah
   - Al Jabin
   - Bilad at Ta’am
   - I purchase in Raymah, but don’t operate in specific districts
   - I do not purchase in Raymah, but some or all of my coffee comes from there
   - I do not purchase in Raymah and I don’t know if my coffee comes from there

16. How many suppliers do you buy from?

17. How many customers (separate businesses) do you sell to?

Purchase habits

18. Have you purchased any of the following types of coffee in the last 12 months? (select all that apply)
   - Udaini (Rima Kubari)
   - Tufahi
   - Bura’ai (Safawi)
   - Dawairi (Sugari)
   - I do not know the variety of the coffee I purchase
   - I buy at least one of the above in addition to one or more other varieties (please specify)
   - I do not purchase any of these varieties

19. How many times have you purchased coffee from your suppliers in the last 12 months?

20. On average, how many kilos of coffee did you purchase from a typical supplier in an individual visit in the last 12 months?

21. In the past 5 years, how often did you have an annual surplus of coffee (you purchased more coffee than you could sell)?
   - Never
   - I more often have a deficit of coffee than surplus (and this is my larger concern)
   - I face a surplus on some parts of the year, but annually it evens out
   - Once or twice in 5 years
   - 3-4 times in 5 years
   - I never can sell all the coffee I purchase
Supplier information

22. What are the top three qualities of a good supplier? (check the three most important qualities, and rank them from 1 to 3, 1= most important, 3= least important)
   a. Quality of product
   b. Quantity of product available at purchase time
   c. Access: distance from base of operation to supplier
   d. Access: ease of communication (eg, he picks up his phone when I call) with supplier
   e. Reliability of supply (can I guarantee standard quality and quantity from this supplier every year?)
   f. Price
   g. Offers specific varieties
   h. Other (specify)

23. What is the average length of relationship between you and your suppliers? (years)

24. How do you find new suppliers? (check all that apply)
   a. Social/Informal network
   b. Farmers Cooperatives
   c. Local (uzla) market
   d. District level market
   e. Governorate level market
   f. Regional market
   g. National market
   h. Union
   i. Formal directory
   j. Other (please specify)

Customer information

25. What is the average length of relationship between you and your customers? (years)

26. What are the top 3 main criteria your customers are looking for when buying coffee? (1=most important)
   a. Price
   b. Quality of coffee
   c. Convenience (sold near to them)
   d. Freshness of the coffee
   e. Packaging
   f. Origins of the coffee
   g. Specialty of the coffee/unique flavour
   h. Methods of production (e.g. organic, fair trade)
   i. Other (please specify)

Behaviour

27. Would you pay more for higher quality coffee than what you currently purchase?
   a. Yes
   b. No
28. If no, why?

29. Would you pay more for coffee that had already been sorted into grades?
   a. Yes  b. No

30. If no, why?

31. Would you pay more for non-mixed (single variety and/or single origin) coffee?
   a. Yes  b. No

32. If no, why?

33. Would you pay more for certified organic coffee?
   a. Yes  b. No

34. If no, why?

35. Would you change suppliers if farmers could provide high volumes of coffee acting as a cooperative?
   a. Yes  b. No

36. If no, why wouldn’t you buy from coffee cooperatives?

37. What are some of the challenges you face in maintaining your business? Rank top 3 (1= most important and commonly faced challenge, 3= least important challenge)
   a. Cannot afford enough coffee to make a good profit at resale
   b. Suppliers only sell in small quantities
   c. Suppliers do not provide consistent quality coffee
   d. Suppliers do not provide consistent quantity of coffee
   e. Difficulty accessing suppliers
   f. Difficulty (physically) accessing customers
   g. Customers do not stay loyal to the business and frequently switch vendors
   h. Competition with other suppliers (at the same level in the chain as you)
   i. Competition with other suppliers (at different levels in the chain—i.e. middleman skipped over)
   j. Lack of credit
   k. High taxes
   l. Lack of marketing
   m. Other (please specify)
   n. No problems

38. Are women involved at any time in your coffee business? (Check all that apply)
   a. No, I do not do any business with women
   b. Yes, they are suppliers
   c. Yes, they are customers (I sell to them)
   d. Yes, I employ them (please specify their role)
ANNEX 2: QUESTIONNAIRE FOR COFFEE PRODUCERS

COFFEE PRODUCERS ASSESSMENT QUESTIONNAIRE
JANUARY 2014

Location Information

- GPS coordinates
- District
- Uzla (sub-district)
- Village

Respondent Information

1. Head of household? (yes/no)
2. Age: ___
3. Gender: (male/female)

A. Farm Basics

A.1. How large is your farm?
A.2. How much land do you devote to crop agriculture (not livestock)? ____ (Ha)
A.3. How many head of livestock (cattle, sheep, goats) do you own? ___
A.4. List the percentage of land that you devote to each crop (answer must add up to 100%. If you do not grow a crop on the list, put ‘0’):
   a. Cereals (millet, wheat, sorghum, corn) _____%
   b. Vegetables _____%
   c. Legumes (beans) _____%
   d. Fruits _____%
   e. Qat _____%
   f. Coffee _____%
   g. Almonds _____%
   h. Palms _____%
   i. Other _____%

A.5. How much saleable product did you yield from each crop in the last 12 months? (Kg/year)
   a. Cereals (millet, wheat, sorghum, corn) _____Kg
   b. Vegetables _____Kg
   c. Legumes (beans) _____Kg
   d. Fruits _____Kg
   e. Qat _____Kg
   f. Coffee _____Kg
   g. Almonds _____Kg
   h. Palms _____Kg
   i. Other _____Kg
A.6. What is the average price you are able to sell each crop (for the last 12 months)? (YER/kg)

- Cereals (millet, wheat, sorghum, corn) ______ YER
- Vegetables ______ YER
- Legumes ______ YER
- Fruits ______ YER
- Qat_____ YER
- Coffee_____ YER
- Almonds_____ YER
- Palms_____ YER
- Other_____ YER

A.7. How much profit did you make in the last 12 months from all agricultural activities? _____ YER

A.8. In the last 12 months, how many people worked on the farm (include paid workers and family members contributing to farm labour)? ___

A.9. Did you hire farm labourers in the last 12 months? (yes/no)

A.9.a. If yes, how many do you hire? ____

A.10. Is the farm your only source of income? (yes/no)

A.11. List your three main sources of income in the past 12 months, including farming, and the income of each (select 1-3, 1 as primary source)

- Crop agriculture _____ YER/month
- Livestock agriculture _____ YER/month
- Unskilled labor _____ YER/month
- Skilled labor _____ YER/month
- Driver _____ YER/month
- Remittances _____ YER/month
- Construction_____ YER/month
- Government _____ YER/month
- Civil (teacher, fireman, etc.) _____ YER/month
- Government remittances _____ YER/month
- Other_____ YER/month

B. Coffee Agriculture

B.1. How many coffee trees do you have on the farm?

B.2. What varieties of coffee do you grow on your farm? (check all that apply)

- Udaini (Rima Kubari)
- Tufahi
- Bura’al (Safawi)
- Dawairi (Sugari)
- Other

B.3. How much did you spend on labour for coffee in the past 12 months? _____ YER

B.4. How much did you spend on agricultural resources (fertilizer, etc.) in the past 12 months? _____ YER

B.5. How many times in the past 12 months do you harvest your coffee crop? _____
B.5.a. In what month do you typically harvest your coffee crop? (select all that apply)

1. [ ] January
2. [ ] February
3. [ ] March
4. [ ] April
5. [ ] May
6. [ ] June
7. [ ] July
8. [ ] August
9. [ ] September
10. [ ] October
11. [ ] November
12. [ ] December

B.6. In a typical year, which of the following do you do to cultivate the crop? (select all that apply)

a. [ ] Stone mulch (placing stones around the base of the tree to catch more water)
b. [ ] Prune and clean trees
c. [ ] Apply fertilizer
d. [ ] Dig a trough around each tree for water
e. [ ] Weed the area around the trees

B.7. What is the average age, in years, of your trees? ____

B.7.a. In what year did you last plant new trees? ____

B.8. Primary drying technique (from the most recent harvest) (select one)

a. Sun-dried on roof or cement, single layer
b. Sun-dried on roof or cement, coffee cherries on top of each other, rotated periodically
c. Sun-dried on roof or cement, coffee cherries on top of each other, not rotated
d. Sun-dried on sand
e. Wood frame coffee driers
f. Solar powered coffee driers
g. Other
h. I sell my coffee undried

B.9. Do you husk your own coffee? (separate the bean from the cherry) (yes/no)

B.10. Which coffee products do you sell? (select all that apply)

a. [ ] Coffee bean
b. [ ] Inner coffee cherry
c. [ ] Outer coffee cherry
d. [ ] Other coffee product

B.11. How long do you typically store your coffee before sale? (select one)

a. Immediately after coffee dries
d. 7-12 months
b. 1-3 months
e. More than a year
c. 4-6 months
f. More than 5 years

B.12. Do you separate your yield into different quality grades? (yes/no)

B.12.a. If yes, how many? ____

B.13. Perceived obstacles to success in coffee agriculture (all that apply)

a. [ ] Pests and diseases
b. [ ] Land ownership issues
c. [ ] Access to credit
d. [ ] Cost of labour
e. [ ] Cost of operation (e.g. seeds, petrol, tools, etc. needed to produce coffee every year) / profit margin
f. [ ] Poor yield
g. [ ] Access to vendors
h. [ ] Access to water
i. Other

B.14. Perceived modes/opportunities to improve current coffee business (all that apply)
a. [ ] Change in cultivation method  d. [ ] Change in sale practices, marketing  
b. [ ] Change in drying method  e. [ ] Change in water/irrigation practices  
c. [ ] Change in sorting, husking  f. Other  

C. Market Information  

C.1. In the past 12 months, what percentage of your coffee yield did you:  
a. Keep for personal consumption _____%  
b. Give as gifts _____%  
c. Sell in informal markets _____%  
d. Sell to local coffee traders _____%  
e. Sell to larger scale coffee wholesalers (people who work in more than one district in Raymah Governorate) _____%  
f. Sell to other coffee processors (roasters, people who make specialty spice blends, etc)_____%  
g. Other_____%  

C.2. How long have you sold to your primary customer? _____ years  

C.3. Currently, what is the distance to the primary market at which you sell your goods? (zero if you only sell to people who come to your home to collect the coffee) _____ km  

C.4. How often do you physically go to markets to sell coffee yield in a typical growing season? (select one)  
a. [ ] At least weekly during harvest season  
b. [ ] Monthly  
c. [ ] Once or twice each harvest  
d. [ ] Annually  
e. [ ] I sell only to a wholesaler who comes to me. I do not go to markets  

C.5. How do you access coffee resellers? (select all that apply)  
a. [ ] The coffee trader lives in my village, I know him  
b. [ ] Communication through friends, neighbours  
c. [ ] Seasonal visits to coffee markets  
d. [ ] Resellers directory or organization  
e. [ ] Travel outside of Raymah Governorate  
f. [ ] Other  

D. Agricultural Water Usage  

D.1. In the past 10 years, how often did you experience water shortages severe enough to affect profitability of your crops? (select one from time brackets)  
a. Severe shortages several times a growing season  
b. Annually, but for only part of the growing season  
c. About once every 5 years  
d. Less than once every 5 years  
e. I have not experienced water shortages  

D.2. What do you do to cope with water shortages? (check all that apply)  
a. Leave house in Raymah, move in with relatives, second home
b. Depend on remittances from relations outside Raymah

c. Purchase water from external sources and truck it in

d. Use greywater from domestic supply

e. Prioritize a smaller area of cropland to get full allowance

f. Give all cropland less water

g. Nothing

h. Other

D.3. Do you irrigate your crops? (yes/no)

D.4. Currently what percentage of your land is irrigated? ____%

D.5. Currently, what is your primary irrigation system? (select one)

a. Sprinkler

b. Drip irrigation

c. Flood/Surface irrigation

d. Spate irrigation

e. Groundwater irrigation

f. Other

D.5.a. Currently, what is your access point to water for the irrigation system? (select one)

a. Spring

b. Temporary dams

c. Permanent dams

d. Piped from groundwater

e. Above ground storage tank

f. Drilled well

g. Dug well

h. Other

D.6. Do you use more than one irrigation system? (yes/no)

D.6.a. If you currently have more than one irrigation system, what are your secondary systems? (all that apply)

a. [ ] Sprinkler

b. [ ] Drip irrigation

c. [ ] Flood/Surface irrigation

d. [ ] Spate irrigation

e. [ ] Groundwater irrigation

f. [ ] Other

D.7. Do you harvest rainwater? (yes/no)

D.8. Do you use an outside source (i.e. access point not on your property) for your water? (yes/no)

D.8.a. What is the distance to the water source? ____ km

D.8.b What type of water source? (select one)

a. Public well

b. Private well

c. Public pump

d. Private pump

e. Public tank/pond/cistern

f. Private tank/pond/cistern

g. Private store

h. Private truck

i. Other

E. Roles and Responsibilities

E.1. Who is the decision maker related to fertilizing of coffee crops?

a. Male household member under 16
b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

E.1.a. Who physically does most of the fertilizing of coffee crops? (select all that apply)

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

g. We don't fertilize our coffee crops

E.2. Who is the decision maker related to pruning of coffee crops?

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

g. We don't prune our coffee crops

E.2.a. Who physically does most of the pruning of coffee crops? (select all that apply)

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

g. We don't prune our coffee crops

E.3. Who is the decision maker related to harvesting (picking) coffee cherries?

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

E.3.a. Who physically does most of the harvesting (picking) coffee cherries? (select all that apply)

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

E.4. Who is the decision maker related to drying coffee?

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

E.4.a. Who physically does most of drying coffee? (select all that apply)

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16

d. Female household member 16 or over

e. Hired labour

f. Unpaid help (neighbours, relatives, etc.)

E.5. Who is the decision maker related to the husking of coffee beans (separating cherry from bean)?

a. Male household member under 16

b. Male household member 16 or over

c. Female household member under 16
d. Female household member 16 or over

E.5.a. Who physically does most of coffee husking? (select all that apply)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. Hired labour – on site
   f. Hired labour – off site
   g. Unpaid help (neighbours, relatives, etc.)
   h. We sell our coffee un-husked

E.6. Who is the decision maker related to coffee sale, small scale (informal markets, individuals)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over

E.6.a. Who implements most of the coffee sale, small scale (informal markets, individuals) (select all that apply)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. Unpaid help (neighbours, relatives, etc.)
   f. We don't sell our coffee in this manner

E.7. Who is the decision maker related to coffee sale, large scale (wholesalers, producers)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over

E.7.a. Who implements most of the coffee sale, large scale (wholesalers, producers) (select all that apply)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. Unpaid help (neighbours, relatives, etc.)
   f. We don't sell our coffee in this manner

E.8. Who is the decision maker related to water for agricultural use (usage management and payment)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. No one consistently fills that role

E.8.a. Who collects water for agricultural use (select all that apply)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. Unpaid help (neighbours, relatives, etc.)
   f. Hired help
   g. Water is delivered to us

E.9. Who is the decision maker related to irrigation infrastructure maintenance repair?
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
e. Community-level governance

E.9.a. Who implements most of the infrastructure maintenance repairs? (select all that apply)
   a. Male household member under 16
   b. Male household member 16 or over
   c. Female household member under 16
   d. Female household member 16 or over
   e. Hired labour
   f. Unpaid help (neighbours, relatives, etc.)
   h. Primary infrastructure is not in control of this household
ANNEX 3: HOUSEHOLD-LEVEL WATER SURVEY

HOUSEHOLD WATER USAGE QUESTIONNAIRE
JANUARY 2014

Location Information
- GPS coordinates
- District
- Uzla (sub-district)
- Village

Respondent Information
4. Age: ___
5. Gender: (male/female)
6. Head of household? (yes/no)

A. HH Profile

A.1. Number of people (M/F)

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td></td>
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<td>5-9</td>
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<td>45-64</td>
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<tr>
<td>65+</td>
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<td></td>
</tr>
</tbody>
</table>

A.2. Household income from last 12 months: ____ YER

A.3. Select the three main sources of income for the last 12 months, including farming, and indicate how much money each source represents

a. [ ] Crop agriculture _____ YER/month
b. [ ] Livestock agriculture _____ YER/month
c. [ ] Unskilled labour _____ YER/month
d. [ ] Skilled labour _____ YER/month
e. [ ] Driver_____ YER/month
f. [ ] Construction_____ YER/month
g. [ ] Government_____ YER/month
h. [ ] Military_____ YER/month
i. [ ] Civil (teacher, fireman, etc.)_____ YER/month
j. [ ] Migrant labour (domestic) _____ YER/month
k. [ ] Migrant labour (international) _____ YER/month
l. [ ] Government remittances _____ YER/month
m. [ ] Remittances from friends/relatives _____ YER/month
n. [ ] Other _____ YER/month

B. Water Usage

B.1. Do you use the same primary water source for drinking water and water for other domestic uses (cooking, washing, etc.)? (yes/no)

B.2.a. If yes, what is your primary water source for all (drinking, cooking) domestic purposes? (select one)
   a. Natural spring
   b. Spring with a cement dam
   c. Spring with a small dam
   d. Harvested rainwater
   e. Dug well
   f. Drilled well
   g. Private water tanker
   h. Shop

B.2.b.1. If no, what is your primary drinking water source? (select one)
   a. Natural spring
   b. Spring with a cement dam
   c. Spring with a small dam
   d. Harvested rainwater
   e. Dug well
   f. Drilled well
   g. Private water tanker
   h. Water pump
   i. Shop
   j. Other

B.2.b.2. If no, what is your primary water source for other domestic uses? (select one)
   a. Natural spring
   b. Spring with a cement dam
   c. Spring with a small dam
   d. Harvested rainwater
   e. Dug well
   f. Drilled well
   g. Private water tanker
   h. Water pump
   i. Shop
   j. Other
   k. Private water tanker
   l. Other

B.4. What secondary water sources do you use for other domestic uses? (select all that apply)
   a. Natural spring
   b. Spring with a cement dam
   c. Spring with a small dam
   d. Harvested rainwater
   e. Dug well
   f. Drilled well
   g. Private water tanker
   h. Water pump
   i. Shop
   j. Other

B.5. If you go and collect water at a well, spring, or water pump how long is the average wait to get water? _____ min

B.6. If the water source not in the house or delivered to the house, what is the distance? _____ km

B.7. Do you pay for water access? (yes/no)

B.7.a. If yes, to whom do you have to pay for primary access?
   a. Water User Association
   b. Local government water bureau
   c. Private supplier – commercial (i.e. a water truck company)
d. Private supplier – informal (eg, a neighbour or neighbouring village)

B.7.b. If yes, approximately how much do you pay a month? ____ YER/month

B.8. Do you keep track of your monthly water usage? (yes/no)

B.8.1. If yes, how? (select one)
   a. Water meter
   b. Family budget
   c. Monthly bill
   d. Dues paid to water collective
   e. Visual estimation of change storage tank level
   f. Other

B.8.2. If yes, how much water do you use for domestic purposes per month on average (in the last 12 months)? ____ thousands of litres

B.9. In the last 5 years, how often did you experience serious (not enough water to fulfil all normal tasks [drinking, washing, cooking] without sacrifices) shortages in drinking water? (select one)
   a. Weekly
   b. Monthly
   c. Several times a year
   d. Annually
   e. We have no problem with domestic water shortages

B.10. What are your main coping strategies when water is scarce? (all that apply)
   a. [ ] Revert to secondary sources of water
   b. [ ] Purchase water from a shop or neighbouring village
   c. [ ] Use less clean water
   d. [ ] Restrict water usage to essential drinking water
   e. [ ] Leave the village until the problem has gone away
   f. Other
   g. [ ] No coping mechanism

B.11. What are the primary barriers to water access? (select all that apply)
   a. Cost (delivery fees, usage fees, etc.)
   b. Sinking water table
   c. Lack of cash to fund proper infrastructure maintenance
   d. Other infrastructure maintenance problems
   e. Lack of infrastructure
   f. Poor resource management at the community level
   g. Other

B.12. Does your household participate in small agricultural activities? (home garden, small plots, etc., meant only for subsistence) (yes/no)

B.12.a. If yes, describe the size of your garden
   a. For my household only
   b. Shared between my household and 1-2 neighbours
   c. Shared with many households in my village
   d. Other

B.13. Does your household participate in large agricultural activities (farm, crop intended for sale) (yes/no)

B.13.a. If Yes, primary irrigation water source
   a. We don’t irrigate our crops
   b. Sprinkler
   c. Drip irrigation
   d. Flood/Surface irrigation
   e. Spate irrigation
   f. Groundwater irrigation
How often did you experience shortages in water for agricultural uses in the past 10 years? (select one)

a. Severe shortages several times a growing season—strongly affects the crop yield
b. Annually, but for only part of the growing season
c. About once every 5 years
d. Less than once every 5 years
e. I have not experienced water shortages

What are your coping strategies? (all that apply)

a. [ ] Purchase water from external sources and truck it in
d. [ ] Give all cropland less water
e. [ ] Leave village until water returns
b. [ ] Use greywater (used, not good for drinking) from domestic supply
f. [ ] Nothing
c. [ ] Prioritize a smaller area of cropland to get full allowance
g. [ ] Other

C. Roles and Responsibilities

C.1. Who is the decision maker related to watering/irrigating the home garden? (select one)

a. Male under 16
d. Female under 16
b. Male over 16
c. Female over 16

C.1.a. Who implements most of the watering/irrigating of the home garden? (select all that apply)

a. Males under 16
d. Females 16 or over
b. Males 16 or over
e. We don’t have a home garden
c. Females under 16

C.2. Who is the decision maker related to water for domestic use (usage management and payment)?

a. Male under 16
d. Female over 16
b. Male over 16
e. No one consistently fills that role
c. Female under 16

C.2.a. Who collects water for domestic use? (select all that apply)

a. Males under 16
d. Females over 16
b. Males over 16
e. Hired help
c. Females under 16
f. Water is delivered to us
D. Coffee Consumption

D.1. Does your family purchase coffee for personal consumption? (yes/no)

D.1.a How much do you buy a month (in the last 12 months)? ____ kg

D.2. Does your family purchase coffee cherry for personal consumption? (yes/no)

D.2.a How much do you buy a month (in the last 12 months)? ____ kg

D.3. Currently how much do you pay for 1kg of coffee? ____ YER

D.4. Where do you usually purchase coffee? (select one)

a. Local shop, packaged
b. Local shop, unpackaged
c. Local market, packaged
d. Local market, unpackaged
e. Coffee trader
f. Neighbours or relatives
g. Other
ANNEX 4: FOCUS GROUP DISCUSSIONS WITH WOMEN

FOCUS GROUP DISCUSSIONS WITH WOMEN
AVRIL 2014

Research questions:

1. What is the role of women in coffee production? (and overall, in the coffee value chain??) What challenges do women face in coffee production?
2. What is the role of women in water management at HH level and in agriculture? What challenges do women face in water management?
3. How can women’s involvement in coffee production be enhanced through improved (community-level) water management?
4. How can women’s knowledge on coffee production be mainstreamed and integrated in coffee production best practices?

Basic information required on each participant:

- Name
- Age
- Who the head of household is
- What is his/her occupation
- Respondent’s occupation
- Marital status
- Households members number
- Address
- Education level
Discussion:

1. How long have you been involved in coffee production?
2. What is women’s role(s) in coffee production?

   Here, we mainly want info on women’s role in tree maintenance (pruning?), picking coffee cherries, processing (such as drying), in sales, and in any other activities they might mention.

   2.1. Why do women not take part in some of (other) the coffee-related activities?
   2.2. How much time do you devote to this (these) activities in your daily routine? What are your other daily chores? How do you balance your traditional chores (e.g. taking care of children etc.) and coffee related activities?
   2.3. Apart from you, who else is involved in these activities? (gender, age, relation to participant (mother, daughter, son etc.).
   2.4. What are their roles and responsibilities?

3. You mentioned (list activities from question 2).
   Who usually makes decision regarding these activities? Are women involved in decision-making regarding these activities?

   3.1. If yes, how?
   3.2. If no, why are women not involved in decision-making?

4. Who usually sale the coffee you produce? And who decides when to sell your coffee production?

   4.1. Do you receive any income for your farming activities?
   4.2. If yes, from whom do you receive this income?

   Here we mainly want to know whether women access/earn an income directly from sales they make, or from the head of HH who gives them a share of the coffee related income, and what is this share.

   4.3 How do you use/manage this income?
   4.4 If women are the ones deciding when to sell their coffee, how do they make this decision (pushes them to sell it at that time in particular)?

5. Where does your knowledge on coffee production come from?

   5.1. Have you ever received any training on coffee production practices?
   5.2. If yes, what kind of trainings?
   5.3. From whom?
   5.4. How has it helped you?
   5.5. If no, how did you learn about these practices and from whom?

6. Would you be willing to receive any training on coffee production practices?

   6.1. What kind of skills would you want to learn?
   6.2. Why?
   6.3. If no, why not?

7. Do you participate in other farming activities? Which ones?

8. What main challenges do you face as women working in coffee production?
8.1. How does this impact you as female producers?
8.2. How do you overcome such challenges?

9. What is the role of women in terms of water management at your household level?
   Here we want information on who collects water at the HH level (gender, and age), how far is the water source, how long does it take women to collect water, and who makes decision regarding water use.
   9.1. How much time do you devote to these activities in your daily routine?
   9.2. How does this affect your other (traditional and productive) activities?

10. Who manages water resources at the community-level? Are women involved in water management and how?
    10.1. What are the main challenges women faces in terms of water management/use at the community level?
    10.2. How do women cope with such challenges?
    10.3. How do you think water management, at the community level could be improved?

11. What kind of water related problems do you face as coffee producers?
    11.1. How does this affect you, and your production?
    11.2. What are the sources of these problems?
    11.3. How do you think these problems/challenges could be solved?

12. Do you often face water shortage?
    12.1. How do water shortages affect you (as a woman) in your daily routine/life?
    12.2. How does it affect your work in coffee production?
    12.3. How do you cope with this problem?
    12.4. How does this affect daily life and work at the community level? Do water shortages create any problem at the community level?

13. Do you use credit in general?
    13.1. If yes, who usually provides credit to you?
    13.2. What is the usual credit rate?
    13.3. What do you use this credit for?
    13.4. If no, why not?

14. What specific financial services would you like to have access to as women and as coffee producers?

15. How would these services help you?

16. Are you part of any farmer cooperatives/nurseries/associations?
    16.1. If so, what is women’s role(s)?
    16.2. How do you/women benefit from it?
    16.3. What challenges do women face, if any?
17. Do you do (coffee related) business with other women?
   17.1. If yes, who are they (other farmers, traders, consumers, etc)?
   17.2. If no, what is the inhibitor?

18. Would you be willing to expand and devote more of your crops to coffee production? Why/why not?

ANNEX 6: MAPS

This annex comprises the following maps:

- Map 1. Raymah Governorate: Proposed Areas of Intervention
- Map 2. Severe Water Shortages Affecting Households Several Times a Year
- Map 3. Households' Main Coping Strategies in Times of Water Shortages
- Map 4. Severe Water Shortages Affecting Coffee Farmers Several Times a Year
- Map 5. Coffee Farmers' Main Coping Strategies in Times of Water Shortages
Raymah Governorate: Assessed areas targeted by ACTED’s Coffee Value Chain Project

For humanitarian purposes only
Production date: 24 April 2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.

Coordinate System: GCS WGS 1984
File: Yemen Raymah_AreaofIntervention_24April2014

Districts area of intervention:
- Al Jabin
- Al Jafariyah
- As Salafiyah
- Kusmah
Severe water shortages affecting household several times a year

For humanitarian purposes only
Production date: 24 April 2014

Households affected by water shortages (per Uzla)
- 20%-40%
- 41%-60%
- 61%-80%
- 81%-100%

Sources:
Severe Water: REACH Field Data Collection
Coordinate System: GCS WGS 1984
File:Yem_15BPH_SevereWaterShortages_24April2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.

Severe water shortages affecting household several times a year

For humanitarian purposes only
Production date: 24 April 2014

Households affected by water shortages (per Uzla)
- 20%-40%
- 41%-60%
- 61%-80%
- 81%-100%

Sources:
Severe Water: REACH Field Data Collection
Coordinate System: GCS WGS 1984
File:Yem_15BPH_SevereWaterShortages_24April2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.
Households’ main coping strategies in times of water shortages

Sources:
Coping strategies: REACH Field Data Collection
Coordinate System: GCS WGS 1984
File:Yem_15BPH_HHCopingStrategies_24April2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.
Severe water shortages affecting coffee farmers several times a year

For humanitarian purposes only
Production date: 24 April 2014

Coffee farmers affected by water shortages (per Uzla)

- 40%-60%
- 61%-80%
- 81%-100%

Sources:
Severe Water: REACH Field Data Collection
Coordinate System: GCS WGS 1984
File: Yem_15BPH_SevereWaterShortages_24April2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.
Coffee farmers’ main coping strategies in times of water shortages

For humanitarian purposes only
Production date: 24 April 2014

Area of study (Uzla)
- Purchase water / From a shop or neighboring village
- Give all cropland less water
- Nothing

Sources:
Coping strategies: REACH Field Data Collection
Coordinate System: GCS WGS 1984
File:Yem_15BPH_FarmCopingStrategies_24April2014

Note: Data, designations and boundaries contained on this map are not warranted to be error-free and do not imply acceptance by ACTED, REACH, donors or any other stakeholder mentioned on this map.