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# GRAPE SUBSECTOR ASSESSMENT REPORT

## FOR THE YEMEN AGRICULTURE SUPPORT PROGRAM



**NOVEMBER 2005**

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## **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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# ACRONYMS AND ABBREVIATIONS

ACC	Amal Cooperative Center
ACU	Agricultural Cooperative Union
AFSF	Agricultural and Fisheries Support Fund
ARA	Agricultural Research and Extension Authority
CSO	Central Statistics Office
FAO	Food and Agriculture Organization
GDA	Global Development Alliance
GDAM	General Directorate of Agricultural Marketing
GDP	Gross Domestic Product
GOY	Government of Yemen
ha	hectares
MAI	Ministry of Agriculture and Irrigation
MISP	Marketing Information System Project
MPIC	Ministry of Planning and International Development
MT	metric tons
SSHARDA	Sana'a, Sa'adah, Hajjah, Amran Agriculture and Rural Development Authority
SCC	Sana'a Cooperative Center
SFD	Social Fund for Development (World Bank)
TOR	Terms of Reference
USAID	United States Agency for International Development
YASP	Yemen Agriculture Support Program
YR	Yemeni Riyal

# EXECUTIVE SUMMARY

The Yemen Agriculture Support Program (YASP) is a three-year, USAID-funded activity designed to improve nutrition and household incomes of small farmers in targeted governorates (Amran, Sa’adah, Al-Jawf, Shabwah, Marib). Several subsector horticultural products that demonstrate growth potential are being systematically explored to determine what, if any, possibilities exist for market expansion. This Grape Subsector Assessment is the first of several studies prepared to assist USAID and the Government of Yemen (GOY) make strategic decisions for potential next steps to expand grape production, processing, and competitiveness for increased exports.

With the time allocated under this consulting assignment, a non-exhaustive preliminary identification on all grape varieties grown in Yemen with emphasis on the Sana’a, Amran, and Sa’adah areas was made. This report provides a detailed description of the principal Yemen grape varieties. The objectives of the Grape Subsector Assessment were to (1) profile and assess the grape value chain in Yemen; (2) provide information on the current production and marketing constraints; and (3) make recommendations for stimulating significant and sustainable expansion of the grape sector.

Some of the principal findings from this study include the following:

- Major factors that determine local preferences of grape varieties produced include consumer’s income, grape variety prices, taste, and supply. Based on the results obtained from interviews with farmers, wholesalers, consumers, and individuals in focus group meetings, the most preferred table grape varieties are Bayadh (White), Aasmi, Raziqi, and Aswad (Black).
- Most of the farmers interviewed packed their produce in plastic 20-kilogram boxes, with the packing process carried out primarily by hired laborers (66.5%) and family members (33.5%).
- The majority of the farmers interviewed use their own vehicles to transport their produce, and the most common vehicle used is the Toyota Hilux truck which has a carrying capacity of 1–1.5 tons or roughly 50 20-kilogram boxes.
- Lack of water is a common problem faced by the grape farmer in the Sana’a, Amran, and Sa’adah Governorates. In Sana’a and Amran, water scarcity is the primary constraint to sector growth; while in Sa’adah, production and processing inputs are the major constraint.
- Grape farmers need of agricultural extension services at the farm level.
- Principal collection markets and marketing services for the grape crop is noticeably lacking, such as sorting and grading services, packing services, transportation and warehousing, and advertising.



Aswad grapes



Aasmi grapes

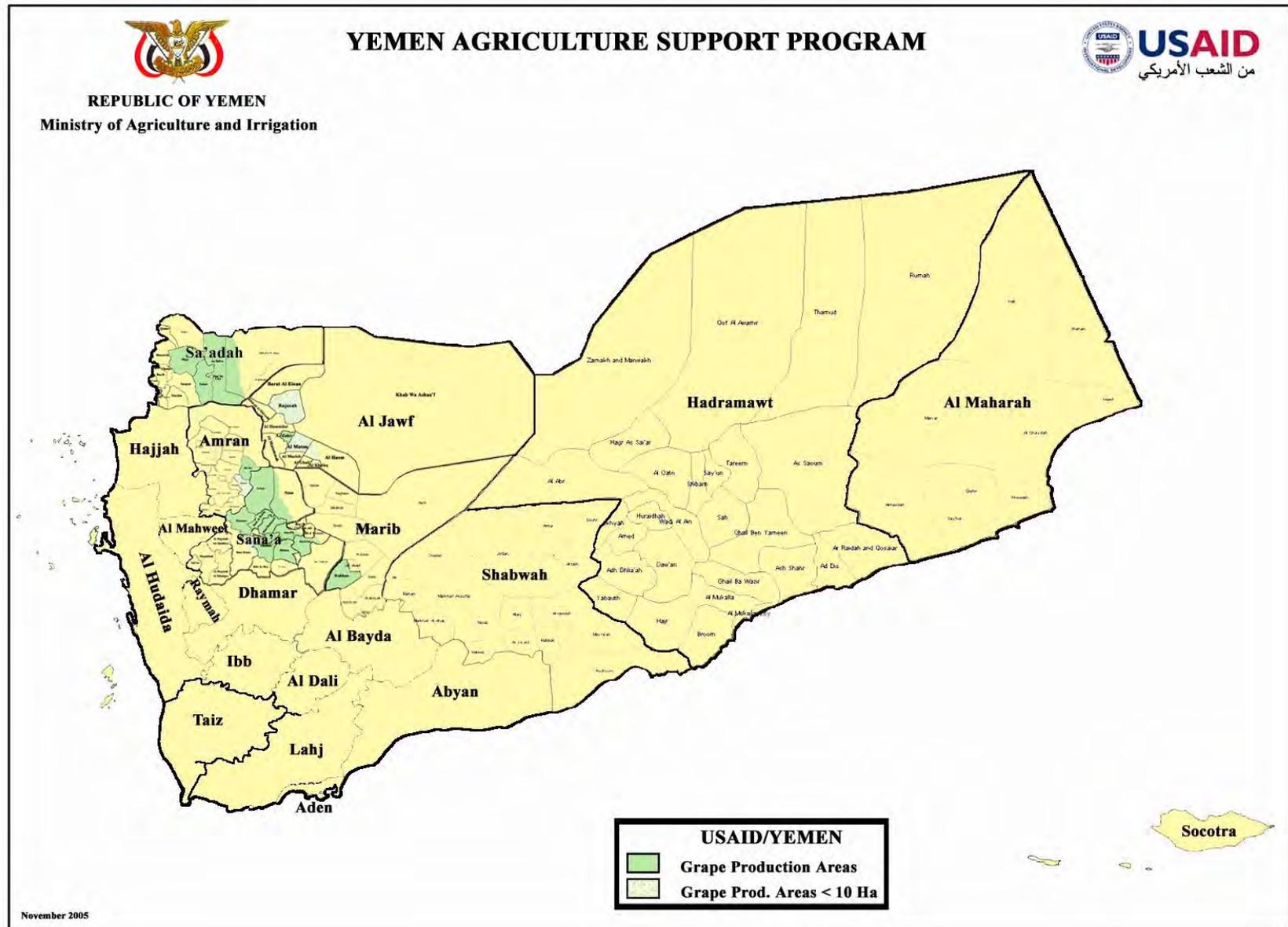


Raziqi grapes

YASP archives, ARD, Inc.

- Refrigerated storage is very important for grape crops, which are highly perishable. The team noticed that this type of service was generally absent although a limited number of refrigerator storage facilities are available in some central markets in Sana'a and Sa'adah—but these are not frequently used by grape farmers due to cost, competition of space with other fruit crops, a first-come first-served basis, or space preference for more highly valued crops.
- The main reasons reported for lower than expected grape harvest in 2005 are disease (53%), cold/hail (26%), water scarcity (11%), excess rain (5%), and birds (5%).

**FIGURE I. GRAPE PRODUCTION AREAS OF YEMEN**



# I.0 INTRODUCTION AND BACKGROUND INFORMATION

Yemen is bordered by Saudi Arabia in the north, Oman in the east, the Arabian Sea and the Gulf of Aden in the south and the Red Sea in the West.

The agriculture sector contributes approximately 16.1% of Yemen’s Gross Domestic Product (GDP) employing 56% of the total labor force. Yemen has a total land area of approximately 55.5 million hectares. Historically, only about 1.15–1.19 million hectares are regularly cultivated and suitable for production.<sup>1</sup>

The mountain range that forms the north-south axis of the country divides Yemen into four distinct agro-ecological zones/regions (see Table 1): lowlands (low rainfall), midlands (medium rainfall), highlands (high rainfall), and intermediate plains (low rainfall). The different agro-ecological zones/regions of the country provide a fitting environment for growing a wide range of crops. In the highlands, temperate zone crops such as cereals, potatoes, pulses, grapes, and deciduous fruits are grown successfully in rain-fed areas and use wells as their primary source of irrigation. In the intermediate plains, wheat, grapes, deciduous fruits, vegetables, and alfalfa are grown with the help of irrigation.

**TABLE I. IDENTIFICATION OF MAJOR CROPS CULTIVATED IN DIFFERENT ECOLOGICAL ZONES**

Farming System	Agro-Ecological Zones	Major Crops
Rain fed	Lowlands (low rainfall)	millet, sorghum and cow peas
	Midlands (medium rainfall)	sorghum, millet and cow peas
	Highlands (high rainfall)	sorghum, maize, wheat, barley, pulses, grapes and deciduous fruits and <i>qat</i>
	Intermediate plains (low rainfall)	barley, wheat, lentil and sorghum
Well irrigation	Lowlands	sorghum, cotton, vegetables, tropical fruits and tobacco
	Midlands	vegetables, <i>qat</i> , tropical fruits, coffee, sorghum and maize
	Intermediate plains	wheat, grapes, deciduous fruits, vegetables and alfalfa
Spate irrigation	Intermediate plains	sorghum, cotton, millet and cow peas

In 2004, 1.18 million hectares were cultivated, inclusive of all agricultural crops, comprising 81.85% of cultivable area. Of the total cultivated area, 57.7% was used for cereal crops; 16.4% for cash crops such as *qat*, coffee, and dates; 10.3% for fodder; 6.8% for fruits; 6.1% for vegetables; and 2.85% for legumes. Fruit crops

<sup>1</sup> Republic of Yemen, Agricultural Statistical Book, 2004, the Central Statistics Organization.

represent approximately 7% of the total land cultivated, out of which about 12,016 hectares were used for grape production, representing 15% of the land used for fruit crops.

In general, Yemen is geographically situated outside the ideal grape-growing zone in the world. Grapes are native to warm, temperate zones between 34° and 49° north and south latitudes whereas Yemen is located between 12° and 19° latitudes. Nevertheless, there were 22,000 hectares in grapes grown in 2003 mostly centered in Sana'a, Sana'a City, Amran, Sa'adah, Al-Jawf, Marib, Shabwah, and Dhamar Governorates. Yemen grapes have the most success growing in the higher elevations, 1350 to 2000 meters above sea level where the climate, soil, and other environmental conditions are excellent for table and raisin grape production. Climatically the aforementioned governorates are well suited to grape growing under irrigation where well water is available or under conditions where precipitation is high. The principal grape vineyard fields in Yemen are located in the following regions:

- Southeast of Sana'a: Khawlan, Jehana, Beni Bah1oul, Sana'a Governorate;
- Northeast of Sana'a: Beni Al Hareth, Bani Hushaish, Sana'a Governorate;
- Northwest of Sana'a: Maswar, Wadi Dahr El-Kabel village and Arhab, Sana'a Governorate;
- East of Sana'a: Shurfa, Rawna and Sa'awan, (Bani Hushaish), Sana'a Governorate; and
- Northern areas: Al-Rawda (Sana'a Governorate), Rayada-Amran (Amran Governorate), and Sa'adah (Sa'adah Governorate).

Grape is an important fruit crop in Yemen. Grape consumption has been increasing since the 1970s as a consequence of rapid urban population growth and a sharp increase in demand. This demand-driven expansion was given a boost by a GOY initiative that promoted increasing grape cultivated areas based upon controlled irrigation from wells; later determined to have negative impact on the Sana'a and Sa'adah water basins where grape trees are mainly planted. Even when taking into consideration farmers' full dependence on controlled irrigation from wells in addition to rain, grape crops appear to represent a viable alternative when compared with banana and other citrus crops.

In a 1998 Food and Agriculture Organization (FAO) report, Yemen ranked sixth among Arab countries in grape production. Grape output and cultivated areas continue to increase gradually as some fruit crops are grown under moderate rainfall and complementary irrigation. However, a sharp decline took place in grape area and production over the 2003-2004 seasons; production decreased from 168,800 tons in 2003 to 104,100 tons in 2004 (62.3% rate decrease) and production fell from 22,200 hectares in 2003 to 12,000 hectares in 2004, representing a rate decrease rate of 83%<sup>2</sup>

In view of the above, the Grape Subsector Assessment considered the effect of GOY agricultural policies in addition to economic and social issues associated with this crop, as well as difficulties and obstacles confronted by grape producers/processors. There has been a considerable expansion of grape production and consumption. There is a strong link between the rise in cash incomes due to the increase in the standard of living and the consumption of grapes. Tables 2, 3, and 4 illustrate grape cultivation in Yemen, including levels of production by major grape-producing governorates, its proportional contribution, crop structure, and productivity per hectare.

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<sup>2</sup> YASP has requested an explanation from the Central Statistics Organization to explain the large decrease in grape production over this period. They have yet to provide us with an explanation.

**TABLE 2. AREA (ha), PRODUCTION (tons) AND PRODUCTIVITY (tons/ha) OF GRAPES IN YEMEN, 1995-2004**

Year	Area	Production	Productivity	Year	Area	Production	Productivity
1995	21,106	150,563	7.13	2000	22,621	155,926	6.89
1996	21,209	98,038	4.62	2001	22,672	162,726	7.18
1997	21,221	150,216	7.08	2002	22,796	164,578	7.22
1998	22,071	154,887	7.02	2003	22,870	168,824	7.38
1999	22,412	155,722	6.95	2004	12,016	104,062	8.66

Source: MPIC; CSO Statistical Year book, 2000-2004. Sana'a. ROY

Grapes comprised the second largest category of fruit crops in terms of area and production—about 23-25% of fruit production per year for 1998–2003. Thus, grapes play an important role in the agricultural economy of Yemen and represent significant cash income to many farmers/households in grape-producing areas as well.

In Yemen, the grape-producing governorates are Sana'a, Sana'a City, Sa'adah, Amran, Hajjah, Marib, Al-Jawf, Dhamar, and Shabwah. Table 3 shows the total area, production, and productivity of grapes by governorate during the periods 1995, 2000, and 2004.

**TABLE 3. TOTAL AREA, PRODUCTION, AND YIELD BY GOVERNORATES 1995, 2000, AND 2004**  
[Area=ha, Production=tons, and Yield=tons/ha]

Governorate	1995			2000			2004		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Sana'a	16,997	121,210	7.131	18,414	130,725	7.1	9,547	82,677	8.66
Sana'a City							920	7,967	8.66
Sa'adah	3,282	24,588	7.49	3,412	29,036	8.5	856	7,413	8.66
Amran							499	4,321	8.669
Al-Jawf	713	3,904	5.48	722	2,345	3.3	82	710	8.679
Marib	78	626	8.03	83	352	4.2	52	450	8.65
Dhamar	23	163	7.8	25	172	6.8	21	182	8.66
Hajjah	13	72	5.5	16	80	5.0	1	9	9
Shabwah							1	9	9.00
Hodeidh							13	113	8.69
Taiz							5	45	9
Al-Beida							15	130	8.67
Ibb							1	9	9
Al-Mahwit							1	9	9
Mukalla							1	9	9
Al-Daleh							1	9	9
<b>Total</b>	<b>21,106</b>	<b>150,563</b>		<b>22,672</b>	<b>162,710</b>		<b>12,016</b>	<b>104,062</b>	

Source: Agricultural Statistics Year Books, MAI, Republic of Yemen. 2000 and May 2005

The area of land under fruit cultivation increased from 56,600 hectares in 1990 to 80,800 hectares in 2004, despite the foregoing water constraint discussed earlier.<sup>3</sup> It is also expected that the area of cultivated land

<sup>3</sup> Republic of Yemen, Agricultural Statistical Book, 1990 and 2004, the Central Statistics Organization.

allocated for fruit production will continue increasing to reach an area of 91,700 hectares by 2010 due to increase in domestic demand. The grape crop is considered a commodity of very high income elasticity and flexibility easily adaptable to the openness of the foreign markets and Yemeni fruit exports.

**TABLE 4. TOTAL AREA (ha) OF KEY FRUITS IN YEMEN**

Year	Fruits	Annual Growth%	Grape	Annual Growth%	Banana	Annual Growth%	Citrus	Annual Growth%
1990	56,575		17,106		7,834		5,012	
1991	61,765	9.2	17,852	4.4	7,462	-4.7	6,029	20.3
1992	64,477	4.4	18,645	4.4	7,771	4.1	6,878	14.1
1993	65,261	1.2	18,817	0.9	8,251	6.2	8,023	16.6
1994	70,391	7.9	17,751	-5.7	8,821	6.9	9,536	18.9
1995	74,862	6.4	21,106	18.9	9,069	2.8	11,714	22.8
1996	78,901	5.4	21,209	0.5	9,360	3.2	12,246	4.5
1997	80,891	2.5	21,221	0.1	9,475	1.2	12,670	3.5
1998	84,062	3.9	22,071	4.0	9,843	3.9	13,039	2.9
1999	88,104	4.8	22,412	1.5	10,144	3.1	13,301	2.0
2000	91,057	3.4	22,621	0.9	10,358	2.1	13,510	1.6
2001	95,247	4.6	22,672	0.2	10,798	4.2	13,975	3.4
2002	97,056	1.9	22,796	0.5	11,061	2.4	14,309	2.4
2003	98,317	1.3	22,870	0.3	11,280	2.0	14,427	0.8
2004	80,835	-17.8	12,016	-47.5	8,837	-21.7	8,841	-38.7
2005*	81,805	1.2	12,244	1.9	8,837	0.0	8,841	0.0
2010*	86,835	1.2	13,453	1.9	8,837	0.0	8,841	0.0

Source: Agricultural Statistics Year Books – Republic of Yemen. (1990 – 2004)

\* Projections Areas

The fruit crop under cultivation in 2004 was estimated at 81,000 hectares. At the same time, the grape crop area is estimated at 12,000 hectares, representing 15% of the total fruit crops being cultivated (Table 5).

**TABLE 5. AREA AND PERCENTAGE OF LAND USED PER FRUIT CROP (OF TOTAL LAND USED FOR FRUIT CROPS) DURING 2004**

Crop	Area	% of Total Area
Grapes	12,016	14.9
Dates	13,739	17.0
Bananas	8,837	10.9
Papaya	1,344	1.7
Citrus	8,841	10.9
Mango	23,226	28.7
Other Fruits	12,832	15.9
<b>Total Fruits</b>	<b>80,835</b>	<b>100.0</b>

Source: Agricultural Statistics Year Books – Republic of Yemen, 2005

Area-wise, mango ranks highest, representing 28.7, followed by dates representing 17 %, then followed by grapes, representing 14.9%. As shown in Table 5, the grape cultivation area decreased 12,000 hectares in 2004

from the previous year. Despite this, the Ministry of Agriculture and Irrigation's (MAI) third Five-Year Plan, 2006-2010 anticipates that grape production will increase from 104,062 tons in 2004 to 131,672 tons in 2010 due to horizontal expansion in grape productivity. This represents an increase ratio of 4% in production and 1.5% in area over the next five years.

# 2.0 YEMEN GRAPE ASSESSMENT – DISCOVERY PHASE

There are about 27 grape varieties reported in Yemen. The major varieties include Aasmi (Red), Raziqi, Aswad (Black), Zeituni, Sofi, Aswad Odari, Bayadh (White), Kawareer, Attraf, Kudair, Qureimai, Bayadh Nasaan, Aswad Hadram, Aswad Dawal, Erqi, and Hatemi.<sup>4</sup> Other varieties include Euoon, Malahi, Ahmar, Tawasi, Zeyadi, Faras, Gershi, Furaw, Sesaban, and Romei.<sup>5</sup> The most popular varieties identified at the time of the interviews were Bayadh, Aasmi, Raziqi, Aswad, Gubari, Zeituni, Attraf, Erqi, and Hatemi. Raziqi species grown in Khawlan include the Othrobi, Senani, and Bayadh grape varieties. In Sa'adah, the Qosebi grape is grown. It is sweet, and has a short branch with small fruit (berries). This variety is preferred by external consumers and is exported to Saudi Arabia.

There are several grape varieties produced in each of the production areas/governorates and available during the production seasons at the markets. The most common varieties found in the markets include the Bayadh, Aasmi, Raziqi, and Aswad grapes. Major factors that determine the local preference of grape variety produced are consumers' income, price, taste, and availability. Based on the information obtained from the farmers, wholesalers, consumers, and the group meetings, the most preferred table grape varieties *for consumers* are Bayadh, Gubari, Aasmi, Raziqi, and Aswad; and *for farmers* are Raziqi, Aasmi, Aswad, and Bayadh. The local preferred varieties of dried grapes (raisins) are the Gubari (and Bayadh), Raziqi, and Aswad. The reason given by consumers for these preferences are taste (sweetness) or the sugar (glucose) content that most distinguishes Yemeni grapes.

The principal use of each variety grown is as follows:

- Bayadh: 70% fresh (table grapes) and 30% dried grape (raisins);
- Aasmi: 100% fresh (table grapes);
- Raziqi: 60% fresh (table grapes) and 40% dried grape (raisins);
- Aswad: 50 % fresh (table grapes) and 50% dried grape (raisins); and
- Gubari: 75% fresh (table grapes) and 25% dried grape (raisins).

The grape sector depends basically on irrigation from wells while rain is considered an additional source of water used in grape production. Based on the farmers' responses, water is a common problem faced by the farmers in Sana'a, Amran, and Sa'adah Governorates. In Sana'a and Amran, water scarcity is the foremost problem; while in Sa'adah, production and processing inputs constrain sector growth more than water scarcity. Yemeni farmers practice a dusting process that involves spraying dust over the grape crops for disease prevention. Many farmers do not apply pesticides and fertilizers. Nevertheless, pesticides are used by the government in the form of mass campaigns when certain plant disease outbreaks occur, such as vine

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<sup>4</sup> Al-Hoseani, Tala A. Econometric Study for the Production and Marketing of Grapes in Yemen. 2001.

<sup>5</sup> Thawrah Daily Newspaper. 6 Aug. 2005. Issue No. (14878). Sana'a, Roy.

mildew, downy vine mildew, etc. Surveys showed that lack of awareness of the types and quantities of pesticides applied in response to disease that affect grape crops, and the lack of dusting equipment were cited as constraints, as well as unnecessarily increasing the costs for these inputs.

Most of the land under grape production is owned by farmers, followed by leased lands. Land tenure or holding size of grape cultivated fields varies from less than one hectare to 10 hectares or more. In the Sa'adah Governorate, it was found that there are owners who possess more than 10 hectares. For farmers with larger landholdings, labor is an important element in the initial startup (the first four years) of grape production due to the level of effort required to establish farming operations and care of trees. Hired labor was ranked third by grape farmers as a constraint during harvest season.

The local system used for grape grades and standards according to the farmers interviewed at the governorate level in Amran showed that farmers gathered and marketed the grapes according to size (82.6%), shape (82.6%), and quality (69.6%) characteristics. Most of the farmers interviewed packed their produce in 20-kilogram plastic boxes (cases), which are commonly used for all produce and the packing process is usually carried out by hired laborers (66.5%) and family members (33.5%).

The traditional method of drying grapes is Al-Oushah, which consists of wooden stakes driven into the ground connected to each other and covered by an iron net screen. Depending on the quantity of grapes harvested, raised Al-Oushah platforms can be established near the vineyard or on the roofs of farm houses, as well as in stores.

Grape farmers need agricultural extension services at the farm level. There is only one extension agent in the Sa'adah Governorate, and is located in the Al-Safra'a District. There are no extension agents in the remaining Sa'adah districts. Similarly in Amran Governorate, there is only one extension agent in the Dhi Bin district. In Khawlan, the available extension services have no significant role in the grape subsector. The results of the field study focus group meetings showed that there are no public or private agricultural research centers devoted to enhancing grape crops. The team conducted visits to the Agricultural Research and Extension

Authority (ARA) at Al-Era'a in the Sana'a Governorate and ARA's headquarters in Dhamar, but failed to come away with any significant information supportive to grape subsector production, processing, and marketing.

There are no principal collection markets and an obvious absence of marketing services for grape crops in any organized or systematic form (for example, in services such as sorting and grading, packing, transporting and warehousing, or advertising). The majority of the farmers interviewed use their own vehicles to transport their produce and the most common vehicle used is the Toyota Hilux truck which has a carrying capacity of 1-1.5 tons. Transportation is always done in open vehicles, with up to 50 20-kilogram baskets per truck.



As grapes are highly perishable, refrigeration storage is very important. The team noticed that this service is generally absent, although a limited number of refrigerators are available in some central markets in Sana'a and Sa'adah. But these are not frequently used by grape farmers due to costs, space competition with other fruit crops, a first-come first-served basis, or space preference for more highly valued crops. The team also observed that there was one Sa'adah farmer who owns a refrigerator where all fruit crops, including grapes, are stored.

The marketing channel for grapes include the agents/traders, middlemen, and buyers/investors with each playing a role in grape subsector marketing. Refrigerator storage owners, most of who are not specialized in grape production, occasionally play a role—the one exception is the Sana'a Cooperative Center (SCC) that was designed for storing grape crops. Agents/traders represent the largest group and are strategically placed in the markets of Sana'a and Amran. Grapes are generally packed and traded in 20-kilogram plastic boxes and typical consignments to the wholesale markets range from 45 to 50 boxes at a time. The main buyers at the wholesale markets at Sana'a, Sa'adah, and Amran are retailers from nearby localities and the surrounding towns, villages, and cities as well as intermediate traders who supply retailers in other locations around the country.

Based on the field survey data collected, the estimated total quantity of grapes supplied to the wholesale markets in 10 cities of selected governorates during the past season was 16,682 tons. This was comprised of 34.9% Aasmi, 28.1% Aswad, 24.1% Raziqi and 12.9% Bayadh varieties. Governorate-wise, the quantity supplied to the Sana'a wholesale market comprises 40.3% of the total supplied by governorates as well as for each variety, followed by Ibb (11.3%), Taiz (11.1%), and Al-Mukalla -Hadramout (10.3%). The peak season for grape demand is greatest in the local markets in August and September, which corresponds to the greatest available supply. The average farm prices for the Bayadh, Aasmi, Raziqi, and Aswad grape varieties are 83, 97, 81, and 77 Yemeni Riyal (YR)/kilogram, respectively. In contrast, average retail prices for these same varieties, Bayadh, Aasmi, Raziqi, and Aswad grape varieties are 210, 177, 196, and 164 YR/kilogram. Table 18 found below in Section 10, shows the average wholesale prices for the Bayadh, Aasmi, Raziqi, and Aswad grape varieties.

Export of agricultural products represents approximately 2% of total overall Yemeni exports, amounting to more than YR 13 billion according to 2003 statistics. Of this figure, fruit exports represent 26% of total agricultural exports, at a value of YR 3.4 billion. Yemeni grapes and raisins represent approximately 17% of the total value of fruit exports, amounting to YR 578 million. This represents only 4% of the total export of the agricultural products (e.g., 0.22% of the Agricultural Domestic Product value and approximately 0.03% of the GDP). The majority of farmers interviewed believe that the importation of dried grapes has had a negative impact on the Yemeni dried grape domestic market share.

Marketing constraints and problems facing grape producers and traders include lack of suitable facilities and services for grape products, inability to obtain timely marketing information on prices from other governorates, inadequate cold storage, high storage prices, crowded markets, high losses during transportation, and the absence of specialized traders for exporting grapes, and poor capacity to negotiate deals outside the country.

# 3.0 OBJECTIVES AND METHODOLOGY

## 3.1 OBJECTIVES

The objectives of the assessment were to (1) profile and assess the grape value chain in Yemen, (2) provide information on the current production and marketing constraints, and (3) make recommendations for stimulating sustainable expansion of the grape sector.

## 3.2 METHODOLOGY

A total sample of 94 respondents including 69 grape producers and wholesale traders and 25 consumers/buyers were drawn from the 11 main districts of grape production in Sana'a, Sa'adah, and Amran following a simple sampling technique. The data collection team consisted of eight qualified and experienced enumerators, four from Sana'a and five from MAI offices in the proposed governorates, working in groups and under the direct supervision of the YASP consultant and his assistant. The consultant supervised the review process of the completed questionnaires, which involved making corrections, converting units, and recording observations and remarks. This process took approximately 10 field days, using two shifts a day, covering the selected eight districts. All data collected was processed using Microsoft Excel® and analyzed in accordance with the objectives specified in the terms of reference (TOR), using simple statistical tools and measures (e.g., means, percentages, minimum and maximum values). Table 6 below shows the distribution of grape producers, traders, consumers, and buyers interviewed in the three governorates.

**TABLE 6. DISTRIBUTION OF RESPONDENTS INTERVIEWED BY CITIES AND DISTRICTS OF THE SELECTED GOVERNORATES**

Governorates/Cities	No. of the Selected Districts	No. of interviewees			Total Respondents
		Farmers	Traders	Consumers	
Sana'a	6	16	3	11	30
Sa'adah	3	17	5	5	27
Amran	2	23	5	9	37
<b>Total</b>	<b>11</b>	<b>56</b>	<b>13</b>	<b>25</b>	<b>94</b>

*Source: field survey*

The assessment was carried out in four phases by local Yemen consultants and covered three governorates that lie within the highlands geographical region of Sana'a, Sa'adah, and Amran. The four phases included (1) preparation, (2) data collection, (3) analysis (data processing, analysis, interpretation), and (4) reporting. Interviews were conducted with 56 grape farmers including 16 farmers selected from Sana'a, 17 from Sa'adah and 23 from Amran.

The three grape production areas/governorates were assessed collectively with respect to the production and marketing of grape sector, using four (parallel) methods of data collection. First, meetings were held with government officials and staff responsible for different production and marketing offices and departments concerned with grape activities. The second targeted sample was the wholesale traders who were interviewed

at the wholesale markets in each area with respect to a number of specific issues and subjects related to marketing system and marketing of grapes. The third sample included consumers, and the interviews took place at the markets in each area. Consumer questions sought to obtain opinions related to grape preferences by variety and prices at the retail markets. The fourth and final method used to gather data was through informal focus group meetings. Four group meetings with farmers, traders, and other participants took place at the markets. The names of people who attended these meetings and the list of persons/officials interviewed can be found in Annex 5.

The questionnaires developed for each of the groups sampled were designed to reflect indicator measures along the grape subsector value chain and identify and assess the perceptions and/or attitudes of the farmers, various market participants and consumers engaged in the production and marketing of grapes. The information and data was collected, recorded, and authenticated with the goal of developing a clear picture on production, marketing, development, and investment opportunities of the Yemeni grapes. Two-day training program/sessions were organized and conducted for the data collectors convened by the consultant and his assistants in the Sana'a and Sa'adah Governorates.

# 4.0 GRAPE VARIETIES GROWN AND QUANTITIES PRODUCED

The main varieties of grapes in Yemen are Bayadh, Erqi, Raziqi, Aasmi, Aswad, Hatemi, and Zeituni. Other less important varieties are Aswad Odari, Aswad Dawal, Bayadh Nasaan, and Kawareer.

All these varieties belong to the Eastern grape varieties known as *Orientalis Negr.*, which is widespread in the Middle East countries of Iran, Afghanistan, Pakistan, and Uzbekistan. The Grape Subsector Assessment team found no varieties of *Pontica Negr.* and *Occidentalis Negr.* in Yemen during the course of their field work. The conclusion we drew is that the source of the Yemeni varieties is Middle Eastern and that through many years of selection by the farmers, we have reached the present status of the grapes found in Yemen. The Eastern grape characteristics include excellent adaptation to local conditions, a long vegetation growth extending from March to December, and drought and salinity resistance against the effect of hot winds.

## 4.1 MAJOR LOCATION AND BASIC CHARACTERISTICS OF EACH VARIETY PRODUCED<sup>6</sup>

Bayadh grape varieties are grown in most of the production areas and targeted governorates: Sana'a, Sa'adah, Amran, Al-Jawf, and Marib. The Aasmi, Raziqi, and Aswad varieties are grown in Sana'a, Sa'adah, Amran, and Marib; while the Zeituni, Erqi, and Attraf varieties are only produced in Sana'a and Sa'adah, and the Hatemi and Bakely only in Amran. However, some of the farmers interviewed reported that the Hatemi and Bakely are considered as classes of the Gubari variety. The Gubari variety name is derived from or attributed to the village of Gubari in Day Bain District, Amran Governorate where it is prevalent. Table 7 provides a summary of the grape variety by governorate and production area location within the district.

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<sup>6</sup> Refer to table showing the areas of cultivation, morphological characteristics and maturation time of the most important varieties of grapes in Yemen in Annex 6a and 6c.

**TABLE 7. MAJOR GRAPE VARIETY BY LOCATION**

Variety	Location/Producing Area	
	Governorate	District
<i>Bayadh</i> . No local synonyms for the variety's name observed.	Sana'a	Khawlan, Gehana, Bani Bahlol, Bani Husheish, Maswar, Wadi Daher-Al-Qabel village, Al-Rawdah, Al-Sharfah, Sa'awan, and Arhab
	Sa'adah	Sahar, Magz, and Al-Safra
	Al-Jawf, Marib, Dhamar, Hajjah	
<i>Aasmi</i> . No local synonyms for the variety's name observed.	Sana'a	Bani Husheish, Khawan, Bani Al-Harth, Hamdan and Arhab
	Amran	Daibaen
	Sa'adah	Magz
<i>Raziqi</i> . (Probably it is "Aaskari", which exist in Pakistan, Uzbekistan, Turkey, and Iran).	Sana'a,	Khawaln, Bani Al-Harith, Gehana, Bani Bahlol, Bani Hushaish, Arahb, Wadi Daher, Al-Rawadh, and Sawa'an
	Amran	Bani Gubar
	Sa'adah	Sahar, Magz, and Al-Safra
<i>Aswad</i> . No local synonyms for the variety's name observed.	Sana'a	Khawaln, Bani Al-Harith, Gehana, Bani Bahlol, Bani Hushaish, Arahb, Wadi Daher, Al-Rawadh, and Sawa'an
	Sa'adah	Sahar, Magz, Al-Safra, Bakem, and Ketaaf
	Amran	Al-Karaf and Deabaen
<i>Gubari (Hatemi and Bakely )</i>	Amran	Debeen and Al-Karaaf
<i>Erqi</i> : No local synonyms for the variety's name observed.	Sana'a	Bani Garmoze, Khawlan and Gehana
	Sa'adah	Sahar, Magz, and Al-Safra
<i>Zeituni</i> . No local synonyms for the variety's name observed.	Sana'a	Arhab, Khawlan, and Barman
<i>Attraf</i> . No local synonyms for the variety's name observed. It is used for making juice and may add one of the Black varieties such as Aswad or Hatemi to gives it a rosy color.	Sana'a	Bani Hushaish, Khawlan, and in Arahab particularly
<i>Aswad Odari</i> . (It looks like <i>Al-Kharzami</i> in Syria)	Sa'adah	Bani Amaar (limited in spread)
<i>Aswad Dawal</i> . No local synonyms for the variety's name observed. (local variety is less widespread).	Sana'a	Arhab
<i>Bayadh Nasaan</i> . No local synonyms for the variety's name observed. Its cultivation concentrated in Arhab area, but in the form of scattered trees and is limited.	Sana'a	Mahal Bait Dafa'a, Al-Gawlah, and Arhab

Source: Field Survey Interviews and ARA, Grape Production Study, Taiz, 1981<sup>7</sup>

<sup>7</sup> ARA, Grape Production Study. Taiz. 1981.

### 4.1.1 Common Varietal Characteristics of Yemen Grapes

#### (1) Varieties served only fresh locally:<sup>8</sup>

- **Aasmī:** Bani Hushaish District in Sana'a is popular in cultivating this variety. It has the following characteristics:
  - The fruit (berries) contains seeds,
  - The shape is circular and its color is pink or rose red,
  - It ripens late in season and begins to show in the markets in the second half of August,
  - Each vine produces 155-160 kilograms of fruit, and
  - The average weight of some clusters is about 700 grams.

#### (2) Other less widespread and popular varieties of fresh grapes:

- **Erqi or Gubari:** The fruit contains seeds and is circular in shape and medium-sized. Its color ranges from green to a transparent white. It is one of the varieties that ripen early.
- **Attraf:** The fruit does not contain seeds. It is similar to Raziqi in color, but bigger in size and longer. It is available in markets at the same time as the Raziqi variety.
- **Zeituni:** The fruit contains many seeds. It is rectangular in shape and red in color. It ripens late in the season.

#### (3) Varieties that are dried to raisins and sold locally:

- **Raziqi:** Bani Hushaish region is popular in cultivating this variety. It has the following characteristics:
  - The fruit does not contain seeds,
  - The shape is oval, and its color is green to yellow,
  - The fruit becomes ripe during July and August,
  - Each tree produces approximately 90-180 kilograms of fruit, and
  - The weight of each cluster is 300-600 grams.
- **Bayadh:** Bani Shaddad region in Khawlan District in Sana'a Governorate is popular in cultivating this variety. It is distinguished by its drought tolerance—irrigation for this variety is limited to seasonal rainfall. It has the following characteristics:
  - The fruit does not contain seeds,
  - The shape is spherical and its color looks transparent white,
  - The fruit becomes ripe at the beginning of June,
  - Each tree produces 90-180 kilograms of fruit, and
  - The weight of each cluster is 300-600 grams.
- **Aswad:** Khawlan District in Sana'a is popular in cultivating this variety. It maintains the following characteristics:
  - The fruits contain seeds,

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<sup>8</sup> Technical and Economic Feasibility Study on Improvement of Grape Production, Harvesting, Processing and Marketing 2005–2007, SSHARDA, June 2005 (not published).

- The fruit is spherical in shape and dark black in color,
- It ripens and matures late in the season and starts to appear in markets during the second half of August,
- Each tree produces 90-115 kilograms, and
- The weight of each cluster is 400-600 grams.

During the interviews, an American grape variety was observed (an early producing grape). This variety was introduced five years ago by an ex-immigrant in Saudi Arabia. He is known to be a well-experienced farmer who has several grape farms and a nursery that is used for seedling propagation. Some of these seedlings were sold to farmers in the Al-Safra district and spread to other districts in the Sa'adah Governorate. Since this variety was introduced via unofficial channels by the farmer, and has not been subject to any scientific field tests for appropriateness and adaptation, it remains at risk.

The majority of the farmers interviewed in Sana'a, Sa'adah, and Amran indicated that the grape output for the Bayadh, Gubari, Aswad, and Raziqi varieties for this year were good and adequate for the last season. The one exception is the Aasmi grape variety which performed less well than expected, as shown in Table 8. The main reasons reported for lower than expected grape harvest in 2005 are disease (53%), cold/hail (26%), water scarcity (11%), excess rain (5%), and birds (5%).

**TABLE 8. RESPONDENTS' OPINIONS ON 2005 GRAPE HARVEST**

Governorate	No. of Sample	Bayadh		Aasmi		Raziqi		Aswad		Gubari	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Sana'a	16	12	2	1	11	4	6	2	10	0	2
Sa'adah	17	10	2	0	0	5	0	12	5	0	0
Amran	23	0	0	0	0	1	0	1	0	19	4
Total	56	22	4	1	11	10	6	15	15	19	6
Subtotal		26		12		16		30		25	
%		84.6	15.4	8.3	91.7	62.5	37.5	50	50	76	24

Source: field survey

#### 4.2 PRINCIPAL USE OF EACH VARIETY GROWN

The principal use of each grape variety grown is shown in Table 9 below.

**TABLE 9. DISTRIBUTION AND PRINCIPAL USE OF EACH VARIETY GROWN (%)**

Governorate	Principal Use of Each Variety Grown	
	% Fresh	% Dried
Bayadh	70	30
Aasmi	100	0.0
Raziqi	60	40
Aswad	50	50
Gubari	75	25

Source: field survey

Farmers interviewed stated that they sell their grapes through three methods: 39.3% of the total sample sells their produce as fresh, 32.1% of the total sample sell their produce as dried (raisins), and 28.6% of the total sample sell their produce as a combination of fresh and dried. At the governorate level, almost half of the farmers interviewed in Amran sell their produce as fresh; while in Sana'a and Sa'adah, farmers sell their grapes as fresh and dried (Table 10). The survey also showed that the majority of farmers interviewed (97.7%) reported selling their grape produce as fresh over dried. Many grape farmers in Yemen who are aware of

market demand at harvest time will try to dry some of the grapes to get better returns during and after the season.

**TABLE 10. PERCENTAGE OF GRAPES SOLD**

Governorate	No. of Sample	Selling Method			
		Fresh	Dried	Fresh & Dried	No Response
Sana'a	16	4	8	4	
Sa'adah	17	7	0	6	4
Amran	23	11	10	2	
<b>Total</b>	<b>56</b>	<b>22</b>	<b>18</b>	<b>12</b>	<b>4</b>
%		39.3	32.1	21.4	7.1

*Source: field survey*

### 4.3 ESTIMATED HECTARES OF EACH VARIETY AND QUANTITY PRODUCED

Table 11a shows that the surveyed farmer's total cultivated area for grapes was 82.6 hectares, broken down as follows: 27.2 hectares (32.9%) for Gubari, 19.75 hectares (23.9%) for Aswad, 19.1 hectares (23.1%) for Raziqi, 9.91 hectares for Aasmi (12%), and 6.71 hectares for Bayadh (8.1%). At the governorate level, in Sana'a, the total cultivated area of interviewed farmers was 43.02 ha, of which 18.6, 10.41, 9.91, 4.0, and 0.1 hectares were grown by Raziqi, Aswad, Aasmi, Bayadh, and Gubari, respectively. In Sa'adah, the total area under cultivation was 11.76 ha, of which 8.7, 2.71, and 0.35 hectares were grown by the Aswad, Bayadh, and Raziqi varieties, respectively. While in Amran, 27.4 hectares were grown of the Gubari variety, and the areas for the Aswad and Raziqi varieties under production were 0.64 and 0.1 hectare, respectively.

**TABLE 11a. ESTIMATED GRAPE AREAS BY GOVERNORATES AND VARIETIES**

Governorate	No. in Sample	Grape varieties area (ha)					Total (ha)
		Bayadh	Aasmi	Raziqi	Aswad	Gubari	
Sana'a	16	4.0	9.91	18.6	10.41	0.1	<b>43.02</b>
% of Sana'a		9.3	23.1	43.2	24.2	0.2	
Sa'adah	17	2.71	0.0	0.4	8.7	0.0	<b>11.81</b>
% of Sa'adah		22.9	0.0	3.4	73.7	0.0	
Amran	23	0.0	0.0	0.1	0.64	27.1	<b>27.84</b>
% of Amran		0.0	0.0	0.4	2.3	97.3	
<b>Total (ha)</b>	<b>56</b>	<b>6.71</b>	<b>9.91</b>	<b>19.1</b>	<b>19.75</b>	<b>27.2</b>	<b>82.67</b>
%		<b>8.1</b>	<b>12.0</b>	<b>23.1</b>	<b>23.9</b>	<b>32.9</b>	

*Source: field survey*

The team learned that the GOY has not been collecting and publishing data on crops and commodities by varieties of grapes, therefore little historical data is available that reports on the estimated hectares of each grape variety under production. However, based on the information the survey team obtained from interviews with the directors of MAI offices, extension workers, and others at the governorate level, estimates of land cultivated and production for each variety in main production areas/governorates are projected for the year 2004, are shown in Table 11b below. The estimated total cultivated area of grapes in the Sana'a Governorate was 9,547 hectares, of which 1,909.4 hectares or 20% was for Raziqi, 3,818.8 hectares or 40% was for Aasmi, 1,909 hectares or 20% was for Aswad, 1,432.1 hectares or 15% was for Bayadh, and 477.1 hectares or 5% for other varieties. In Sana'a City, the estimated total area was 920 hectares; the Raziqi, Aasmi, Aswad, Bayadh, and other varieties representing 40%, 20%, 20%, 15%, and 5%, respectively. In Sa'adah, the Aswad grape variety predominates; it occupies about 75% of the grapes cultivated, while in Amran the Gubari variety occupied about 85% of the total grape area cultivated.

**TABLE 11b. ESTIMATED GRAPE AREAS AND PRODUCTION OF GRAPES BY VARIETIES IN SIX GOVERNORATES AND SANA'A CITY, 2004 (AREA=ha; PRODUCTION=Tons)**

Governorate		Raziqi	Aasmi	Aswad	Bayadh	Other <sup>a</sup>	Total
Sana'a	Area	1909.4	3818.8	1909.4	1432.1	477.1	9547
	Production	33070.8	16335.4	16335.4	12251.6	4133.9	82127
Sana'a City	Area	368.0	184.0	184.0	138.0	46	920
	Production	3186.8	1593.4	1953.4	1195.1	398.4	8327
Sa'adah	Area	42.8	42.8	642.0	85.6	42.8	856
	Production	370.7	370.7	5559.8	741.3	370.7	7413
Amran	Area	25.0	25.0	25.0		424 <sup>b</sup>	499
	Production	216.1	216.1	216.1		3672.9 <sup>b</sup>	4321
Marib	Area			52.0			52
	Production			450.0			450
Shabwah	Area	1.0					1
	Production	9.0					9
Al-Jawf	Area	32.0		50.0			82
	Production	277.5		432.5			710

Source: CSO/MPIC, *Statistical Yearbook*, 2005.

<sup>a</sup> Other: Zeituni, Attraf, Erqi, etc.

<sup>b</sup> Gubari variety

#### 4.4 POST-HARVEST PROCESSING

The sample group indicated that grape gathering or collection is done when the crop is fully mature, though it varies according to variety, production regions, and environmental conditions. There are few traders or agents that gather the crop from the farms. Buying and selling the crop is mostly done in the central markets of larger cities and towns but some farmers sell their produce at the farm.

##### 4.4.1 Grading

About 64.3% of the farmers interviewed in the three governorates reported that they carried out a grading and sorting process after grape harvesting. At the governorate level—of the 23 farmers in Amran, 15 farmers (65.2%) stated that they graded and sorted their produce; whereas in Sa'adah, 12 farmers (70.6%) and 9 farmers (56.3%) in Sana'a reported that they graded and sorted grapes after harvesting. Almost all grape farmers carried out the grading process manually.

**TABLE 12. GRADING AND SORTING GRAPES AFTER HARVEST AND METHOD OF TRANSPORT**

Governorate	No. of Sample	Grading and sorting after grape gathering		Transport by Vehicles
		Yes	No	
Sana'a	16	9	7	16
Sa'adah	17	12	5	17
Amran	23	15	8	23
	<b>56</b>	<b>36</b>	<b>20</b>	<b>56</b>
%		<b>64.3</b>	<b>35.7</b>	<b>100.0</b>

Source: field survey

Table 13 provides results from the survey questions regarding whether farmers harvest and market grapes according to size, shape, and quality specifications or characteristics. The results show that 64.3% pay attention to size versus 69.6% who pay attention to shape, and 67.9% pay attention to the quality of the grapes. This is a strong indication that the majorities of grape farmers interviewed in three governorates gather/harvest and market their grapes with the greatest of care. The team was able to confirm that post-harvest processes have been actually carried out by farmers in Sana'a who sell grapes to supermarkets, hotels, and catering agencies in the major cities, and in Sa'adah by framers who export their grapes to Saudi Arabia and other neighboring countries.

**TABLE 13. MARKETING GRAPES ACCORDING TO SIZE, SHAPE, AND QUALITY**

Governorate	No. of Sample	Size		Shape		Quality	
		Yes	No	Yes	No	Yes	No
Sana'a	16	8	8	10	6	9	7
Sa'adah	17	9	8	10	7	13	4
Amran	23	19	4	19	4	16	7
<b>Total</b>	<b>56</b>	<b>36</b>	<b>20</b>	<b>39</b>	<b>17</b>	<b>38</b>	<b>18</b>
		<b>56</b>		<b>56</b>		<b>56</b>	
<b>%</b>		<b>64.3</b>	<b>35.7</b>	<b>69.6</b>	<b>30.4</b>	<b>67.9</b>	<b>32.1</b>

*Source: field survey*

#### 4.4.2 Packing

Regarding the packing process, as mentioned earlier, it was found that most of the farmers interviewed packed their produce in plastic 20-kilogram boxes (cases) commonly used for all produce and this process is carried out by hired laborers (66.5%) and family members (33.5%). The plastic rectangular, 20-kilogram containers used by all grape producers after harvest are fabricated at Salah Ad Daim, one of several plastic manufacturing plants in Yemen.

#### 4.4.3 Storing

Shortage of adequate storage facilities in the grape-producing areas is a serious problem facing the grape subsector as well as other agricultural products. The team visited the Central Market in Sa'adah City where refrigerator storage exists with the support of the Agricultural Cooperative Union (ACU) in order to help farmers store fruits such as apples, pomegranates, oranges, and grapes. This cold storage consists of eight rooms; each room can store up to 900 boxes, with a total capacity of 7,200 boxes. Farmers can rent a room at YR 60,000 per month. One example of the utility of having adequate storage can be seen with one farmer who reported that he rented two rooms for about three months and stored 1,700 boxes of apples. At the time he put his apples in storage, one box sold for YR 1500;



Packing Aasmi grapes in Amran.



The Amal Cooperative Center is used for export preparation of fruits from the Sa'adah Governorate. Inside the Center is equipment used for washing, grading and packaging grapes.

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when he sold a box of apples months later (that was kept in cold storage) the price had doubled to YR 3,000. He earned a net profit of YR 1,288 per box.

Another cold storage visited by the team is owned by the Amal Cooperative Center (ACC) established to support exporting agricultural products. This center was financed by a private investor who owns agricultural lands with other farmers and aimed at providing post-harvest services (i.e., grading, sorting, packaging and storing). The ACC has a 12,000-box storage capacity. Similarly, this private investor stated that he bought fruit produce and stored it for three to four months before exporting a portion to neighboring countries and selling the rest in domestic markets at YR 3,000 per box. He earned a net profit of YR 1,300 per box. Both of these cases offer clear evidence that some grape farmers have learned the value of having adequate storage for their produce.

#### **4.4.4 Transportation**

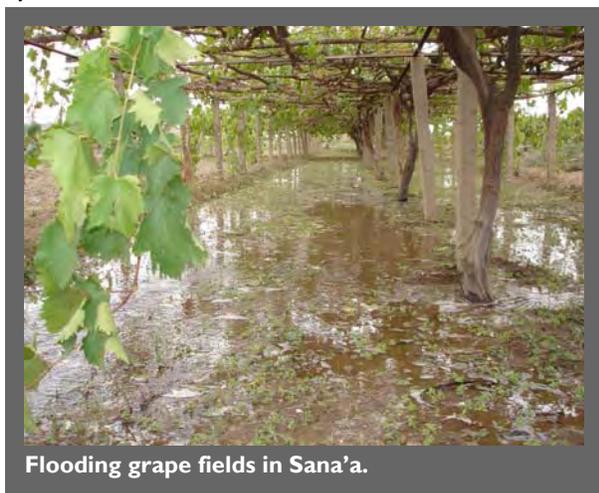
The majority of the farmers interviewed transport grape produce using their own vehicles as discussed above. Most grape farmers own or rent a truck to transport their produce to markets. Fuel costs for irrigation (see Section 5.1) and vehicles, inclusive of repairs and maintenance, are one of the major expenses incurred by the grape farmers.

# 5.0 INPUTS AND SERVICES TO THE GRAPE SECTOR

## 5.1 WATER

The grape subsector depends heavily on irrigation from wells. Rain is considered an additional source of water to supplement water wells. Based on the farmers' responses, water scarcity is the major problem faced by farmers in Sana'a, Amran, and Sa'adah Governorates as shown in Table 14. In the Sana'a Governorate,

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Khawlan and Jehanah Districts are the two major districts who suffer from scarcity of water. The team noticed that there are no modern irrigation networks (for example, dripping irrigation) being used except in certain grape farms in Sa'adah, where the team observed a modern irrigation network. Sa'adah farmers' use of drip irrigation has led to much less water use, a net reduction in irrigation costs and an increase in the production per unit of area. The average grape crop requires between 10 and 12 irrigations during the season. Some farmers stated that if water were available in adequate volume, areas of grape farms would increase accordingly. **Many grape farmers appear to be over-irrigating their fields. Fields are flooded to a depth of 25-30 centimeters, which means that 2,500-3,000 cubic meters of**

**water is added every 15 to 20 days as was observed at Bani Hushaish and Rawda.** In other areas close to Sa'adah, wadi water is being used for flooding, which covers the field to a depth of 50-60 centimeters, bringing the irrigation water to 6,000 cubic meters. The team noted, however, that farmers are unable to drill wells due to increases in the costs of mechanized water pumps and accessories and the high price of fuel used for irrigation per hour. These constraints facing farmers have periodically led to lower grape yields and less land being cultivated.

**TABLE 14. AVAILABLE INPUTS AND SERVICES**

Governorate	Inputs and services to the grape sector					
	Land	Water	Labor	Processing	Marketing	Other
Sana'a	0	1	3	0	2	4
Sa'adah	0	2	3	0	1	4
Amran	0	1	3	0	2	4

*Source: field survey*

## 5.2 FERTILIZERS AND CHEMICAL PESTICIDES

The Yemeni farmers practice the process of "dusting" that involves spraying dust over the grape crops to prevent the spread of diseases. Many farmers do not apply chemical pesticides and fertilizers. Nevertheless, pesticides are used by the government in the form of campaigns when certain diseases are reported such as

vine mildew and downy mildew. In this respect the only major disease noted by the team in vineyards visited is powdery mildew. The present system of control used by farmers is dusting with fine soil particles. Some researchers recommended using appropriate and efficient pesticides in controlling this particular disease, given the fact that the pesticides cost half as much as the dusting operation currently used by the farmers. Lack of awareness as to the appropriate type and quantity of pesticides applied with respect to diseases affecting grape crops is a production constraint. Like irrigation, there is a tendency by grape farmers to overuse agricultural inputs, which increases farmer production costs. Weeding or unearthing and removal of shrubs and handling of the grape bunches is usually done three times a season on average. Local fertilization using manure is completed once every one to two years at a ratio of 40 to 60 kilograms per tree. This does not constitute a burden or an obstacle to the farmer.

### **5.3 SERVICES**

Provision of services is equally important for inputs. Usually there are two types of services noted by farmers interviewed. Crop-related services are carried out by the farmer and his family and do not constitute any burden on the farmer. Supportive services (business development services) may be carried out by the state, the private sector, investors, the Cooperative Union, and the international agencies and organizations. This latter category is in nascent stage at best and farmers have limited contact and support from these groups.

### **5.4 THE AGRICULTURE EXTENSION BODY**

Agriculture extension normally plays a vital role in delivery of information and disseminating results from research centers to the farmers. At the same time, it conveys the concerns and problems of the farmers to the research centers. Grape farmers have a desperate need for agricultural extension services at the farm level. Currently, there is only one extension agent in the Sa'adah Governorate, who is located in the Al-Safra District. There are no extension agents in the remaining districts. Similarly in the Amran Governorate, there is only one extension agent in the Dhi Bin region. In Khawlan, although there is an extension agent on location, he is currently not providing any services to the grape farmers.

### **5.5 RESEARCH**

The results of the field study showed that there are no research centers concerned specifically with grapes. Visits were conducted to both the local branch of the Agricultural Research and Extension Authority (ARA) at Al-Era'a in the Amran Governorate and the headquarters of ARA in Dhamar. These visits produced little information helpful to the study. The grape subsector could benefit from scientific studies on numerous aspects, including precise water requirements and the exploration of creating new disease-resistant varieties. In the Sa'adah Governorate, the team found a new variety of grape that has been under cultivation for the past five years, called the American Type. It came into the area through one farmer from the Kingdom of Saudi Arabia. However, this variety was not subject to scientific research (e.g., conducting tests for diseases and whether it will be successful in the Yemeni environment).

### **5.6 CULTIVATION PRACTICES**

Grapes in Yemen are grown on supported arbors (wood and stone structures) that are 1 to 1.4 meters high, about eight meters wide, and 30 to 40 meters long (see photo on previous page). The carrying pillars are made of stone while the top is made with Ethel tree branches. This system makes pruning, weeding, and harvesting operations a challenge as no animal or machine can fit under the arbor. Farmers could be interested in piloting other types of support structures if introduced to facilitate mechanization, especially as the costs for labor continue to rise.

*Spacing* – The team observed that the spacing used between the grape vines/trees varies according to grape varieties and areas. However, the farmers feel there is a need to establish the best spacing to be used between grape vines. It is felt that the present spacing of 8 by 16 meters, giving each vine 128 square meters, is too much and could be reduced.

*Pruning* - The team observed that the current system of pruning in Yemen is severe or spur pruning. Grape farmers also indicate that the degree of pruning varies from one variety to another.

*Infrastructure* - Roads, networks, telephones, and electricity services are somewhat available for the grape sector.

## 6.0 GRAPE LAND OWNERSHIP

Grapes are being cultivated in lands that are generally fertile. The total estimated irrigated area of the farmers interviewed is 132.7 hectares, of which 121.7 hectares (91.7%) is owned by the producer. Table 15 below shows that the interviewed farmers owned areas representing 89.9%, 98.3%, and 89.2% of the total area in Sana'a, Sa'adah, and Amran Governorates, respectively.

Land-related problems appeared rare, based on the information provided by the farmers interviewed. The majority of land is owned by farmers, followed by leased lands. Land tenure or the holding size of a grape cultivated field varies from less than one hectare to 10 hectares; however, the average area is around one to three hectares. In the Sa'adah Governorate, however, it was found that there are several grape producer/owners who possess more than 10 hectares. These are larger quasi-commercial farms such as the Abu Miskah and Sheikh Abdul Ilah Al-Ahmar farms. The team noted that there are opportunities to expand development of the grape sector due to the availability of cultivable, large tracts of lands in grape-producing areas, especially in the Sa'adah Governorate and in other governorates such as Marib and Al-Jawf.

**TABLE 15. IRRIGATED AREA BY OWNERSHIP STATUS AND GOVERNORATES**

Governorate	No. Of Sample	Owned	Rented	Shared	Endowment (Waqaff)	Total	%
Sana'a	16	45.80	1.80	2.43	1.22	51.25	38.62
Sa'adah	17	43.70	1.14	0.50	0.00	45.34	34.17
Amran	23	32.20	1.30	2.60	0.00	36.10	27.21
<b>Total</b>	<b>56</b>	<b>121.70</b>	<b>4.24</b>	<b>5.53</b>	<b>1.22</b>	<b>132.69</b>	<b>100.00</b>
<b>%</b>		<b>91.72</b>	<b>3.20</b>	<b>4.17</b>	<b>0.91</b>		

*Source: field survey*

# 7.0 SUMMARY OF CONSTRAINTS TO GRAPE SUBSECTOR DEVELOPMENT AND EXPANSION

## 7.1 LAND

Land fragmentation remains the main constraint for the grape sector as for other crops in Yemen. The average holding size for the sample was between 1.5 to 2.5 hectares, which is considered within the small farmers group or category specified in the country. As discussed under Section 2 - Discovery Phase and Section 6 - Grape Land Ownership, the majority of the land under grape production is owned by the farmers.

## 7.2 WATER

Water resource management is considered one of the main constraints for the grape subsector. The team observed that irrigation practices for grapes appear to be less than a precise science or 'eyeballed' by many grape farmers. Fields are flooded to a depth of 25 to 30 centimeters, which means that 2,500 to 3,000 cubic meters is added every 15 to 20 days. In another grape field observed by the team, located near Sa'adah, a wadi water source was used for flooding, covering the field to a depth of 50 to 60 centimeters, bringing the amount of water used to 6,000 cubic meters. Considering the high cost and scarcity of water, there is a need to minimize irrigation water as much as possible, which can be established through targeted research.

## 7.3 LABOR

Labor is an important element in the initial startup of a vineyard, during the first four years before grape production gets underway. Table 14, shown above, demonstrates that hired labor can also become a constraint to grape farmers, and is ranked third in the order of required input resources to the sector. It is worth mentioning that focus group meetings revealed that many farmers depend on families and hired labor when necessary. The team also observed that no sprinkler or plowing equipment is currently being used within the sample group.

## 7.4 PROCESSING AND MARKETING

Grape drying is carried out using a traditional method called Al-Oushah. The structure uses wooden stakes connected to each other covered with an iron net. The size of this structure will vary depending on the quantity of grapes harvested for drying. The Al-Oushah is usually found close to grape farm fields or on the rooftops of the farm houses. There are no central collection markets for grape produce and a general absence of organized and systematic marketing services such as sorting/grading, packing, transportation, warehousing or advertising for grape crops.

Few farmers sell their grape crop in the markets of the capital city to places such as grocery stores, supermarkets, or hotels since they would be required to understand buyer specifications. Most of the grape farmers interviewed have little knowledge of these requirements. Grapes are primarily packed into plastic 20-kilograms boxes. Grapes are transported in open pickup trucks that can carry loads of up to 50 20-kilogram boxes. There is an overall absence of adequate storage, although refrigerators are available in some central markets in Sana'a and Sa'adah, but they are rarely used for the grape crops. Most farmers sell their crops to middlemen.

Some of the constraints cited by wholesale traders in Sana'a and Amran Governorates include their doubt of the honesty of grape farmers with respect to their grading and sorting standards; spoiled, damaged, or defective grapes; shortage of labor; and high farm gate prices. Other constraints noted included the lack of markets with suitable facilities and services for grapes, lack of timely price information on markets of other governorates, high storage prices, crowded markets, high loss rates of crops during transportation, and the absence of specialized traders knowledgeable of grape export requirements. The traders felt their major problems were high transportation charges and prices of packaging materials.

Overall, the major constraints in three governorates are ranked below:

- **Sa'adah:**
  1. Marketing
  2. Diseases
  3. Water
- **Sana'a:**
  1. Water shortage in Khawlan district; spread of plant disease; and marketing
  2. Decline of water tables in Sana'a basin and increasing costs for drilling water wells
- **Amran:**
  1. Increasing costs for drilling, pump equipment, and accessories
  2. Marketing, obtaining best prices for produce
  3. Diseases and pesticides (mildew and grape moth)



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## 8.0 OPPORTUNITIES FOR EXPANDING GRAPE PRODUCTION

About 53.6% of the farmers interviewed in the three governorates expressed willingness to expand their grape production as shown in Table 16. Governorate-wise, 68.8%, 52.9%, and 43.5% of the total farmers interviewed expressed willingness to expand grape areas in Sana'a, Sa'adah, and Amran, respectively.

The main reasons farmers would not want to expand production areas were cited (in order of importance), as follows:

- Increasing diesel prices,
- Disease and breeding of grape seedlings,
- Lack or shortage of irrigation water,
- Lack of well-equipped markets with required facilities,
- Lack of funds or financial support,
- Unavailability of stakes and other materials needed for grape cultivation, and
- Increasing costs of well drilling.

**TABLE 16. WILLINGNESS TO EXPAND GRAPE ACREAGE UNDER PRODUCTION**

Governorate	No. of Sample	Yes	%	No	%
Sana'a	16	11	68.8	5	31.2
Sa'adah	17	9	52.9	8	47.1
Amran	23	10	43.5	13	56.5
<b>Total</b>	<b>56</b>	<b>30</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>
<b>%</b>			<b>53.6</b>		<b>46.4</b>

*Source: field survey*

## 9.0 VARIETIES, VOLUMES AND LOCAL MARKET TIMING

Table 17 shows the volume of grapes, sorted by variety, that were supplied to the wholesale markets in the main cities of 10 governorates during the production season (May to November) of 2004. Total quantity supplied to these markets was 16,682 tons of grape produce, of which the Aasmi, Aswad, Raziqi, and Bayadh varieties comprise 34.9%, 28.1%, 24.1%, and 12.9%, respectively. Governorate-wise, the quantity supplied to Sana'a wholesale markets comprises 40.3% of the total supplied quantity and for each variety as well, followed by Ibb (11.3%), Taiz (11.1%), and Mukalla (10.3%). Data and figures were collected by the MAI/General Directorate of Agricultural Marketing (GDAM) – Marketing Information System Project (MISP) and currently cover only 11 governorates; thus, the above total quantity supplied to the wholesale markets does not reflect the total quantity consumed or traded within each city and governorate in Yemen. The estimated total quantity of grapes supplied to the wholesale markets described above represents only about 16% of the total production of grapes in 2004. The team learned that the ideal time to market grapes in local markets was in August and September, when the demand is at a peak and the supply is highest (refer to Table 6 in Appendix 6).

**TABLE 17. THE ESTIMATED ANNUAL TONNAGE FOR GRAPES BY VARIETIES IN WHOLESALE MARKETS FOR SELECTED GOVERNORATES IN 2004**

Grape Variety	Total	Sa'adah	Amran	Abss	Say'un	Hodaidh	Mukalla	Ibb	Taiz	Aden	Sana'a
Bayadh	2,148	35	81	183	10	86	75	240	97	13	1,328
Raziqi	4,025	273	113	177	57	332	495	417	417	279	1,465
Aasmi	5,830	83	232	310	375	412	675	669	715	206	2,153
Aswad	4,683	127	245	251	48	457	481	552	630	119	1,773
<b>Total</b>	<b>16,686</b>	<b>518</b>	<b>671</b>	<b>921</b>	<b>490</b>	<b>1,287</b>	<b>1,726</b>	<b>1,878</b>	<b>1,859</b>	<b>617</b>	<b>6,719</b>
%		<b>3.1</b>	<b>4.0</b>	<b>5.5</b>	<b>2.9</b>	<b>7.7</b>	<b>10.3</b>	<b>11.3</b>	<b>11.1</b>	<b>3.7</b>	<b>40.3</b>

Source: MAI – GDAM, MISO. Annual Report. Sana'a, GOY, 2005

# 10.0 PREVAILING PRICES

Table 18 shows the average prices of grape varieties at farm, wholesale, and retailer levels collected during the fieldwork interviews. The average farm prices for the Bayadh, Aasmi, Raziqi, and Aswad grape varieties are 83, 97, 81, and 77 YR/kilograms, respectively. Whereas, the average retail prices for the Bayadh, Aasmi, Raziqi, and Aswad grape varieties are 210, 177, 196, and 164 YR/kilograms, respectively. The table also shows the average wholesale prices for the Bayadh, Aasmi, Raziqi, and Aswad grape varieties. Marketing margins at retail level for each variety is high, which affects farmer profits. In general, the team noticed that the difference in price of grape produce at farm and retail/consumer levels varies from 40 to 50% or more. This may be attributed to the existence of middlemen or intermediaries in the marketing channel between the producer/farmer and the consumers.

**TABLE 18. AVERAGE PRICES OF GRAPES (YR)**

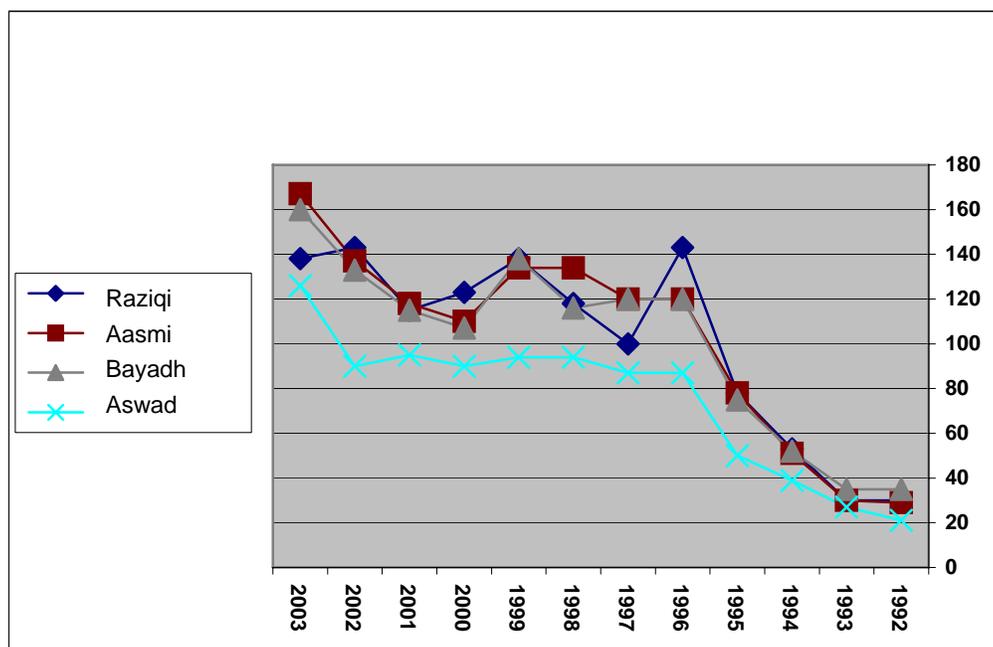
Variety	Prices				
	Average	Farm	Wholesale	Retailer	Marketing Margins (retail price-farm price)
Bayadh	134	83	110	210	127
Aasmi	129	97	114	177	80
Raziqi	125	81	97	196	115
Aswad	112	77	95	164	87

*Source: field survey*

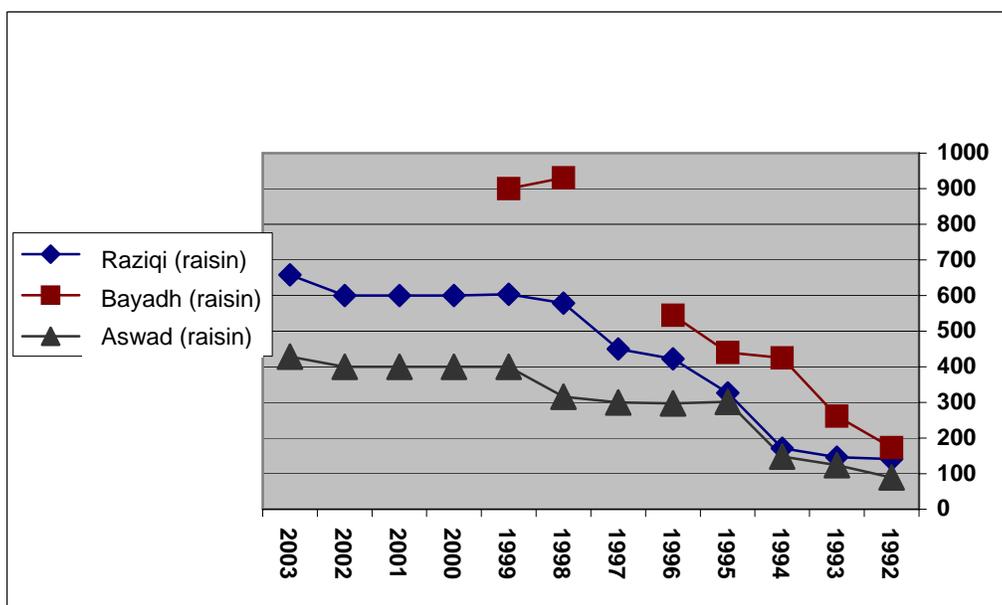
In light of the above findings, it seems that the small farmer has little recourse to hold back his produce in order to take advantage of the gradually rising market prices. Thus grape crops are sold at the lowest market prices. Moreover, the high perishability of grapes prohibits them from prolonged shipments to their final destination.

The marketing margin for the retailer at Sana'a City in 2004 calculated by the GDAM is also high with absence of marketing services provided for grape crops. Figures 1 and 2 show the average retail prices for fresh and dried grapes. Figures 3 and 4 illustrate average wholesale prices for fresh and dried grapes by varieties in selected cities and governorates during 1992-2004, collected and published by the MAI/GDAM.

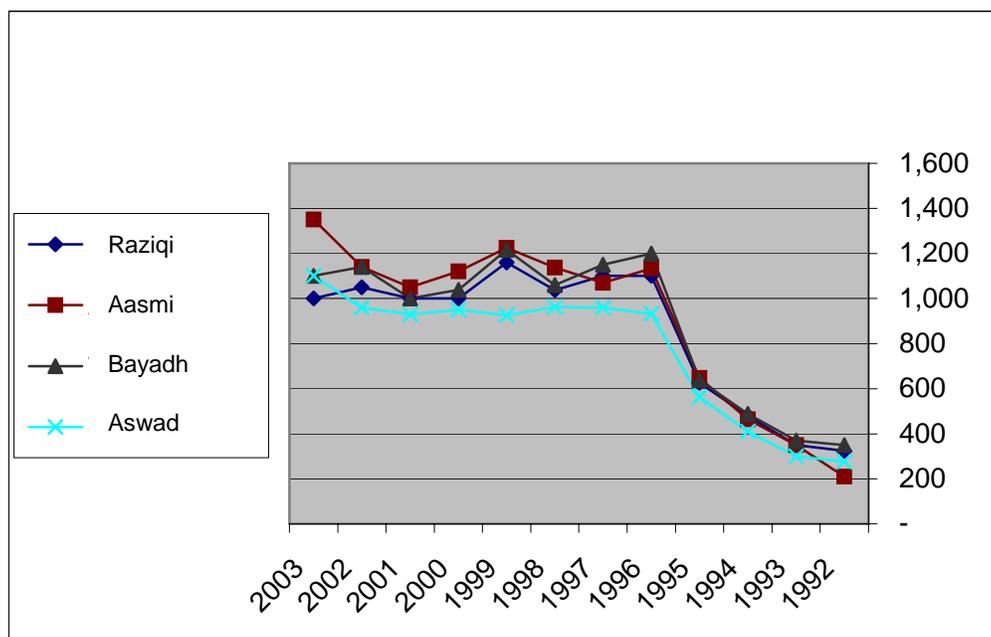
**FIGURE 2. AVERAGE PRICES OF GRAPES BY VARIETY IN SANA'A (YR/KG) DURING 1992 TO 2003**



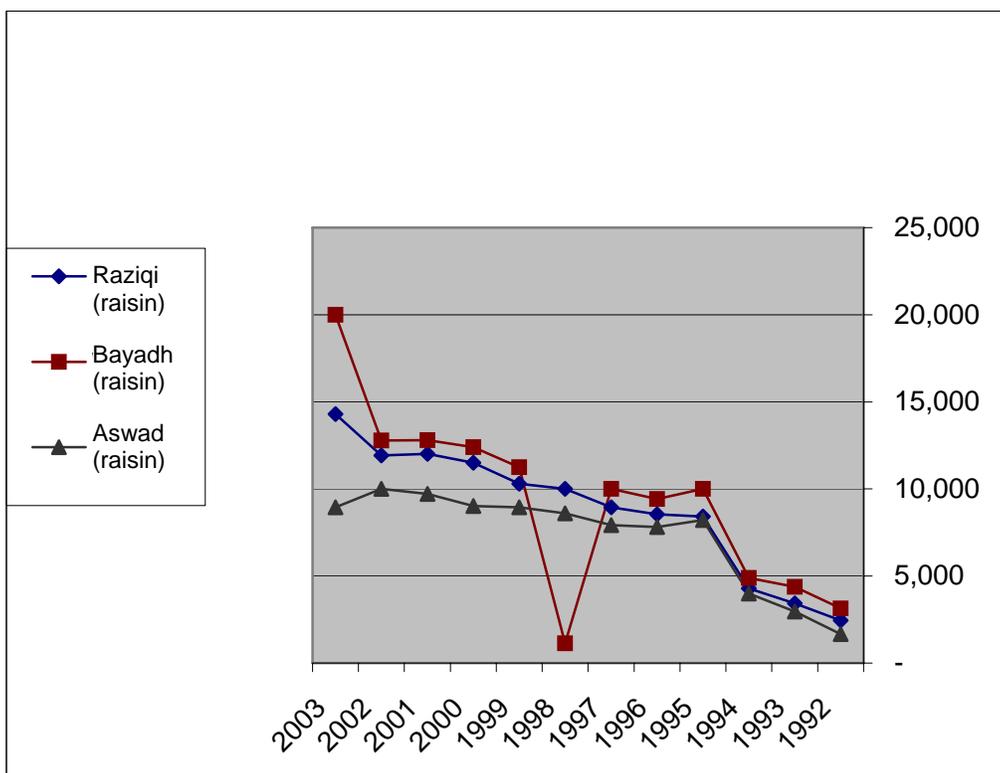
**FIGURE 3. AVERAGE RETAIL PRICES FOR DRIED GRAPES IN SANA'A (YR/KG) DURING 1992 TO 2003**



**FIGURE 4. AVERAGE WHOLESALE PRICE FOR GRAPES BY VARIETY IN SANA'A (YR/KG) DURING 1992 TO 2003**



**FIGURE 5. AVERAGE WHOLESALE PROCESS OF DRIED GRAPES BY VARIETY IN SANA'A (YR/KG) DURING 1992 TO 2003**



# 11.0 GRAPE MARKETS AND TRADE PATTERNS

## 11.1 DOMESTIC MARKET DESCRIPTION AND ANALYSIS

The team observed that grape marketing, like many of the key Yemen subsector products, follows a complex network of local relationships. The wholesale markets in each governorate visited revealed that the grape trade is channeled entirely through a small number of agents (two to four) at the markets. These agents have other individuals who work for them in an informal capacity. At the wholesale markets, the agents are usually located at specifically designated sections within the markets, where apart from grapes, they are responsible for monitoring and tracking other fruits (pomegranates, watermelons, and other frequently traded produce).

Most wholesale markets are run under the auspices of the Yemen government while cooperative markets operate under the auspices of the ACU, where the agents are responsible for organization and management of their respective areas of responsibility. The agent pays rent to the municipality for utilization of market floor and office space, and operational costs such as electricity, water, and cleaning services. The agents, in turn, charge commission to both suppliers and buyers ranging from YR 500 to 1000 per vehicle load of grapes, assuming a loading capacity of 1–1.5 tons per vehicle. Commission fees for buyers generally average YR 50 per 20-kilogram box. Retailers from nearby localities and the surrounding towns, villages, and cities are the main buyers at the wholesale markets at Sana'a, Sa'adah, and Amran. They also serve intermediate traders, who supply product to retailers in other locations and cities in the country.

## 11.2 TRADE PATTERNS

Farmers or suppliers pay market entrance fees of YR 150 to 200 per vehicle, and in some Sana'a markets, a fee of YR 60 to 70 per vehicle is charged for cleaning services when leaving the premises. The majority of the farmers and traders usually stay at the markets until their produce has been sold.

Grape retailers in Sana'a and Sa'adah are usually found at the larger public retail markets which have specialty fruit and vegetable shops or supermarkets. Retailers pay fees for the market floor and for cleaning services by the municipality. Farmers, whose grape fields are situated just outside Sana'a City, usually sell their grape produce directly to supermarkets, hospitals, and hotels.

The survey showed that services provided by the trader include packaging (37%), grading and sorting (32%), transportation (21%), and storage (11%). The grading and sorting services are greatest in Sana'a, in response to consumer demand expressed through retailers, supermarkets, and hotels.

# 12.0 FRESH AND DRIED GRAPE VARIETY PREFERENCES

For domestic markets the preferred varieties are the Aswad, Gubari, Raziqi, and Bayadh as fresh grapes. With respect to dried grapes (raisins), the preferred varieties are the Aswad, Raziqi, Gubari, and Bayadh varieties as reflected in Table 19 below. For the export markets, interviews revealed that the preferred varieties for fresh grapes are the Gubari, Aswad, and Aasmi; and Raziqi, Gubari, and Aswad are the preferred dried grape varieties.

**TABLE 19. GRAPE VARIETY PREFERENCES FOR DOMESTIC AND EXPORT MARKETS**

Governorate	Domestic Markets										
	Fresh grapes (%)						Dried grapes (%)				
	Bayadh	Aasmi	Raziqi	Aswad	Gubari	Attraf	Bayadh	Raziqi	Aswad	Gubari	Attraf
Sana'a	7	0	4	13	0	3	1	3	15	0	1
Sa'adah	9	11	11	10	2	2	11	13	7	0	1
Amran	2	3	5	4	20	0	1	6	2	15	0
<b>Total</b>	<b>18</b>	<b>14</b>	<b>20</b>	<b>27</b>	<b>22</b>	<b>5</b>	<b>13</b>	<b>22</b>	<b>24</b>	<b>15</b>	<b>2</b>
Governorate	Export markets										
	Fresh grapes (%)						Dried grapes (%)				
	Bayadh	Aasmi	Raziqi	Aswad	Gubari	Attraf	Bayadh	Raziqi	Aswad	Gubari	Attraf
Sana'a	0	0	0	0	0	1	0	1	0	0	0
Sa'adah	1	1	1	2	0	0	2	0	2	0	1
Amran	2	3	1	2	9	0	1	5	2	4	2
<b>Total</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>

*Source: field survey*

# 13.0 THE ROLE OF THE AGRICULTURAL COOPERATIVE UNION IN THE GRAPE INDUSTRY

The Agricultural Cooperative Union (ACU) was established to support farmers and provide them with institutional and technical support. Agricultural cooperatives in Yemen have three basic functions:

1. Procurement and distribution of production supplies like chemicals fertilizers, improved seeds, etc.;
2. Assistance in the marketing of agricultural produce; and
3. Provision of financial services to meet producer credit requirements.

Most Yemen cooperatives visited by the team reflect limited capacity but do provide some services under the first function.

Reviewing the goals and policies of the ACU's third Five-Year Plan (2006-2010) provides some insight to the vital role that ACU envisions itself playing in support of the Yemen agricultural sector. A synopsis of ACU objectives follows:

## **Establishment of projects that are already implemented:**

- Cooperative markets,
- Productive agricultural projects,
- Cooperative associations, and
- Export preparation centers.

## **Projects that are under implementation:**

- Amran Cooperative Market,
- Sa'awan Cooperative Market,
- Marib Cooperative Market,
- Al-Shehn Cooperative Market in Al-Mahara,
- A'ataq Cooperative Market in Shabwah,
- Packaging production factory,
- Cooperative information network, and
- Irrigation networks production factory.

## **Facilitating establishment of new projects:**

- Agricultural production preservation and refrigeration stores;

- Cooperative Agricultural Complex Center; and
- The National Project for Production, Harvest, Processing and Marketing of Grapes.

**Program for establishing cooperative associations in 2006:**

- Ownership of vehicles and transportation means for grapes; and
- Ownership of equipment, factories and machinery to process grapes such as segregation and washing, drying and packaging for a number of markets and the National Grapes Project.

The ACU plays an important role with regard to various types of the agricultural associations. From the field visit and the sample group surveyed, few if any associations currently exist to support the grape sector or producers. The fledgling groups that do exist have not been responsive to the needs of grape farmers.

# 14.0 GRAPE AND RAISIN EXPORT

About 59%, or a little over half of the total farmers in the three governorates, indicated that they did not export grapes or sell their produce to export traders. Other grape farmers do regularly export their crop through local traders based in their region. Governorate-wise, about 58.8%, 43.5%, and 18.7% of the total farmers interviewed in Amran, Sa'adah, and Sana'a, respectively, export their grapes and sell it via export traders as indicated in Table 20. Grape producers in Sa'adah have more access to the Saudi markets where they earn significant returns from sales. The team visited one of the export centers located in the Alab, north of Sa'adah. Alab is a border post for exporting grapes and other agricultural products to Saudi Arabia.

**TABLE 20. DISTRIBUTION OF RESPONSES ON GRAPE EXPORTS**

Governorate	No. of Sample	Yes		No	
		No.	%	No.	%
Sana'a	16	3	18.7	13	81.3
Sa'adah	17	10	58.8	7	41.2
Amran	23	10	43.5	13	56.5
<b>Total</b>	<b>56</b>	<b>23</b>		<b>33</b>	
%		41.1	100.0	58.9	100.0

*Source: field survey*

## 14.1 EXPORTED VARIETIES

Based on the interviews with grape farmers and export traders, the main varieties for export are Aswad and the Raziqi varieties. Unfortunately, data on exported varieties is not available.

## 14.2 EXPORTED QUANTITIES

Table 21 shows that the exported quantities for fresh grapes and dried grapes in 2004 were 149.7 tons and 70.1 tons, respectively.

## 14.3 EXPORT PRICES

Table 21 shows that the quantities and values of exported fresh grapes and dried grapes reached YR 134,080,000 and YR 189,395,000, respectively.

**TABLE 21. QUANTITY AND VALUE OF FRESH AND DRIED GRAPE EXPORTS IN 2004**

Item	Quantity (Tons)	Value (1000 YR)
Fresh grapes	149.6993	134,080
Dried grapes (raisins)	70.0967	189,395

*Source: MPIC/CSO, Statistical Year Books. 2005.*

#### 14.4 EXPORT RECIPIENT COUNTRIES

Table 22 illustrates the quantities and values of the exported fresh grapes and dried grapes to recipient countries in 2003. Saudi Arabia ranked first for the quantity of imported Yemeni fresh and dried grapes with 1,498.1 tons for fresh grapes and 695.8 tons for the dried grapes. In general, grape producers believe the low export quantities of Yemeni fresh and dried grapes is due to the absence of marketing services, including grading, sorting, packing, promotion and advertisement, market research on external consumer preferences with respect to varieties, standards and specifications requested for export, inadequate and unqualified export centers to provide the services, and equipment needed for competitive export promotion.

**TABLE 22. QUANTITIES AND VALUES OF FRESH AND DRIED GRAPE EXPORTS IN 2003 (WEIGHT=ton, VALUE= 1000 YR)**

Commodity	Saudi Arabia		U.A.E		Japan		Djibouti		Total	
	Wt.	Value	Wt.	Value	Wt.	Value	Wt.	Value	Wt.	Value
<b>Grapes</b>	1,498.1	113,205.0	2.0	80.0	1.0	87.0	11.8	578.0	1,512.9	113,947
<b>Raisins</b>	695.8	202,829.3	0.2	18.5					696.0	202,848

*Source: MPIC/CSO, Statistical Year Books. 2004.*

# 15.0 GRAPE PRODUCTION CONTRIBUTION TO YEMEN GDP

Export of the agricultural products represent approximately 2% of the total overall Yemeni exports, amounting to more than YR 13 billion, according to 2003 GOY statistics. Of this percentage, fruit exports represent 26% of the YR 13 billion cited above, at an estimated value of YR 3.4 billion. Exportation of Yemeni grapes and raisins represents approximately 17% of the total value of fruit exports. At YR 578 million, this represents only 4% of the total export of agricultural products (0.22% of the Agricultural Domestic Product Value and approximately 0.03% of the Gross Domestic Product).

Decrease of the marginal contribution is not necessarily an indicator of retrogression/decline of Yemeni export of grapes and raisins; on the contrary, the following table shows that the value of the Yemeni exports of grapes and raisins is increasing, from YR 138 million in 1998 to YR 578 million in 2003; i.e., an average annual growth rate of 27%. Grapes comprised the second largest category of commodity exports.

**TABLE 23. YEMEN GRAPE EXPORT AND IMPORT DURING 1998–2002 (1000 MT)**

<b>Years</b>	<b>Exports</b>	<b>Imports</b>
1989 – 1991	3.3	0.0
1999	3.3	0.0
2000	3.7	0.0
2001	5.1	0.0
2002	7.9	0.1

*Source: FAO Indicators Report, prepared by ESSA, July 2004.*

Grape is a fruit that has nutritional and economic significance. Evidence from interviews and research seem to indicate that the potential for expanding grape production and exports to neighboring Gulf States is great. Table 24 shows current grape production for various Arab countries and the proportional share for each country within the Arab world. Total regional grape production was 3,040 tons in 2003. Egypt maintains the highest rate of grape production, and is by far the largest producer in the region, accounting for nearly 39.4% of the total production; followed by Iraq (11%), Syria (10.1%), Morocco (9.3%), Algeria (8.8%), Yemen (5.6%), Tunisia (4.8%) and Lebanon (3.9 %).

**TABLE 24. MAIN ARAB GRAPE PRODUCING COUNTRIES 1994-1998, 1996-2000, 1999-2003 (1000MT)**

No	Country	94-1998	1996 – 2000	1999	2000	2001	2002	2003	% (for 2003)
1	Egypt	843.2	970.8	1,009.6	1,075.1	1,078.9	1,073.8	1,196.9	39.4
2	Iraq	383.4	321.6	274.0	277.0	300.0	335.0	335.0	11.0
3	Syria	465.6	475.7	387.0	409.5	389.0	342.0	307.3	10.0
4	Morocco	192.3	218.6	334.8	206.7	191.9	227.2	281.3	9.3
5	Algeria	174.8	183.5	178.2	203.8	203.0	234.4	267.0	8.8
<b>6</b>	<b>Yemen</b>	<b>140.0</b>	<b>142.9</b>	<b>155.7</b>	<b>155.9</b>	<b>162.7</b>	<b>164.6</b>	<b>168.8</b>	<b>5.6</b>
7	Tunisia	101.0	114.4	130.0	140.0	145.0	113.5	145.0	4.8
8	Lebanon	349.5	256.4	99.2	112.6	116.2	102.0	119.4	4.0
9	Saudi Arabia	133.2	129.2	116.0	117.0	116.0	92.0	97.0	3.1
10	Palestine	55.0	54.1	44.5	59.3	57.8	78.2	58.3	2.0
11	Jordan	63.0	65.5	56.0	67.0	80.5	34.8	34.0	1.0
12	Libya	34.0	39.7	38.6	50.0	40.0	30.0	30.0	1.0
13	Emirates	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
14	Qatar	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0
15	Kuwait		0.01					0.01	0.0
	<b>Total</b>	<b>2,935.3</b>	<b>2,972.8</b>	<b>2,823.8</b>	<b>2,874.1</b>	<b>2,881.2</b>	<b>2,827.6</b>	<b>3,040.0</b>	<b>100.0</b>

*Source: Arab Organization for Agricultural Development Report, 2004*

# 16.0 DRIED/FRESH GRAPES IMPORTATION IMPACT ON LOCAL PRODUCTION AND MARKETING

Table 25 shows that the majority of farmers interviewed (87.5%) feel that the importation of dried grapes is having a direct effect on the Yemeni dried grape market. Most of the farmers and traders interviewed emphasized that due to low prices of the imported raisins, local prices and demand have lowered for local grape produce and this has impacted their incomes.

**TABLE 25. IMPACT OF IMPORTATION OF DRIED GRAPES**

Governorate	No. of Sample	Yes		No		No Response	
		No.	%	No.	%	No.	%
Sana'a	16	15	26.79	0	0.00	1	1.79
Sa'adah	17	13	23.21	3	5.36	1	1.79
Amran	23	21	37.50	1	1.79	1	1.79
<b>Total</b>	<b>56</b>	<b>49</b>		<b>4</b>		<b>3</b>	
%		87.5		7.1		5.4	

*Source: field survey*

# 17.0 RECOMMENDATIONS

The circumstances by which opportunities can be exploited for stimulating significant and sustainable expansion of the grape subsector in Yemen can only be viewed in the context of improving product quality to achieve competitiveness, strengthening production infrastructure to meet buyer specifications, reinforcing market mechanisms to attract trade investment, and building the capacity of market participants along the entire grape value chain. The grape subsector requires technical assistance in all of these areas, therefore it would make the most sense to identify what aspects of the subsector can most easily fit USAID/Yemen strategic objectives to increase incomes and improve the nutritional status of the people of Yemen. Further consideration could be given to potential Global Development Alliance (GDA) opportunities or building synergy across other USAID/Yemen-supported programs in education, health, and democracy and governance.

## 17.1 PRODUCTION

1. Grape farms (vineyards) in Yemen are currently free from a devastating insect known as Phylloxera. Therefore, great precaution needs to be taken not to import any new grape varieties, except under strict control and conditions. This is particularly true when soil and roots are moved with the vine. A scientifically organized system of root stock selection needs to be introduced to establish mother vineyards for further propagation.
2. Considering the high cost and scarcity of water, minimizing water irrigation should be done as much as feasible. A switch to a modern irrigation network (drip irrigation) should be considered, taking into consideration its significance in reducing random flooding of grape fields and increasing productivity of yields. This can readily be established through limited on-site research trials under YASP supervision.
3. Grape vines in Yemen are grown on arbors that 1 to 1.4 meters high, eight meters wide, and 30 to 40 meters long. This system makes cultivating operations rather difficult, as no animal or machine fits under the arbor. YASP should consider introducing other types of support structures to facilitate mechanization of the needed cultivating practices, especially as labor is rather costly.
4. The only major disease noted in the vineyards is powdery mildew. The present system of control used by farmers is dusting with fine soil particles. Local research scientists recommend using appropriate and efficient pesticides in controlling the disease. YASP should investigate the feasibility of working with the cooperatives to see if safe pesticides can be made available to members.
5. YASP target governorates should be explored for the potential to expand grape areas and link smallholders to the grape export value chain. It is expected that moving the early varieties to warmer areas would make these varieties mature even earlier. This early market can be used for export purposes, even to grape-producing countries when table grapes ripen much later. Consider supporting the grape subsector with water (artesian wells), for example, or grants reimbursement, in select governorates that will target support to a group of farmers with small land tenures (one well for a number of farmers—or one well to cover a number of hectares).
6. Provide direct support to strengthen the capacity of farmer cooperatives with the goal of enhancing extension services to grape producers. Identify an appropriate research center to investigate the utility of obtaining buy-in for the on-site trials for grapes.
7. Provide training to agricultural extension agents in how to conduct demonstration farms in grape production areas and maintaining the relations between research centers and extension activities. Support areas might include:

- a. Provide production inputs (pillars, pesticides, fertilizers, sprinklers, drip irrigation systems, dusting equipment) on a cost or loan basis;
  - b. Review planting techniques, e.g., the best spacing to be used between and with the grape vines—as many farmers believe that the present spacing is too much and should be reduced; and
  - c. Introduce efficient low-cost technology for drying grapes to shorten the process and lower the loss rate.
8. Consider providing farmers with improved grape drying technology and equipment for transforming grapes to raisins and juices. Consider piloting low-cost technology in each target grape-producing region as a demonstration model. Link activity to local producer associations and cooperatives.
  9. Consider coordinating and supporting a Sana'a University program linked with a US agricultural school for:
    - a. A collection and testing of grapes species/varieties,
    - b. The study of origins, and
    - c. The conducting of experiments for scientific purposes.

## **17.2 MARKETING**

- Consider establishing pilot collection markets that are adequately equipped and appropriate for grape crops in the key grape-producing areas.
- Consider introducing refrigeration systems within the central wholesale markets in the governorates and cities, and in coordination with the ACU and other concerned government institutions, that can accommodate storage of the grape crop. Begin with one to three refrigerator storage units in selected areas with 12,000 to 15,000 fruit box capacities.
- Consider introducing a buyer-driven specifications data distribution system using ACU and local government offices, including rural radio, to enhance producer understanding of grades and standards requirements. Identify and introduce low-cost technologies for improving grading and sorting at the farm.
- Investigate the viability of working with private sector and GOY to help establish a Grape Exporters Association.
- Engage an international grape expert to identify foreign buyers with respect to export requirements, marketing services, and preferred grape varieties and develop a marketing strategy to build the image of Yemen grapes using media advertising and promotional activities.
- Investigate the viability of establishing canning plants or manufacturing units for sales to domestic consumers and for regional export.

These recommendations to develop the grape sector in Yemen can be regrouped under two major categories: technology enhancement and capacity building. Concentrating on the selection of appropriate technologies to be introduced will conserve water use and improve processing methods to help meet grades and standards for export. Strengthening individual and institutional capacities will inform grape producers on improved farming and processing techniques, and facilitate group planning for inputs and market data. Working with the local cooperatives to enhance their capacity to deliver business development services to members is critical to sustaining production quantity and quality. All or part of the above-mentioned recommendations and activities should be supported through coordination with the ACU and other relevant government institutions, which may also require institutional strengthening. Initiatives such as the Agricultural and Fisheries Support Fund (AFSF), Social Fund for Development (SFD), the Rural Roads Project supported by the World Bank/International Development Association and other donor-financed activities in Yemen could add value through closer collaboration and opportunities to leverage scarce resources.

# ANNEXES

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# ANNEX I

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## Terms of Reference



## Scope of Work

### Production and Marketing Assessment of the Grape Sector in Yemen

#### **A. Introduction**

ARD, Inc. is implementing the USAID-funded Yemen funded Yemen Agriculture Support Program (YASP). Under YASP, ARD is responsible for the design and implementation of a three-year program to improve nutrition and household incomes of small farmers in the targeted governorates (Amran, Sa'ada, Al-Jawf, Shabwah and Marib) through supporting the Yemeni agriculture sector. YASP has been requested by USAID Yemen to plan and implement an assessment of the grape sector in Yemen.

#### **B. Objectives**

(1) Profile and assess the grape value chain in Yemen; (2) provide information on the current production and marketing constraints; and (3) make recommendation for stimulating the significant and sustainable expansion of the grape sector.

#### **C. Tasks**

1. Review the relevant literature and documents related to grapes in Yemen.
2. Identify grape varieties grown, quantities produced, major location of each variety produced, local reasons for preference of variety produced, principle use of each variety grown (% fresh, % dried and % juice), market demand for each variety and estimated hectares of each variety under production.
3. Define and prioritize the constraints (land, water inputs, labor, processing, marketing and other factors) and opportunities for expanded grape production, with emphasis upon the five target governorates.
4. Identify ownership of land patterns and issues as related to grape production, hectares under production, and any problems or restrictions caused by land and its use which affect production, marketing, development and investment opportunities.
5. Identify currently available inputs and services to the sector and determine the extent to which both their availability and quality impact sector growth.
6. Describe and analyze the markets and trade patterns for grapes produced in Yemen.
7. Identify variety preferences for both fresh and dried grapes in local markets and for export.
8. Identify markets, market participants, processors and investors in the industry. What is their comparative importance?
9. What is the role of the Agricultural Cooperative Union in the grape industry?
10. What impact does importation of both dried and fresh grapes from outside Yemen have on local production and marketing of Yemen produced grapes?
11. What are the prevailing prices at farm, wholesale and retail levels by variety and season?
12. Define and prioritize recommendations for stimulating the significant and sustainable expansion of the grape sector in Yemen.

**D. Deliverables:**

1. Draft work plan for carrying out consultancy within 3 calendar days of award
2. Detailed final report outline within 5 calendar days of award
3. Progress report on completion of preparation phase;
4. Progress report on completion of data collection phase;
5. A complete report in English, following the approved final report outline, within 35 calendar days of award
6. A report appendix with a copy of all resource documents, including raw data entry sheets for interviews conducted, data analysis, interviewee contact information and a bibliography of all literature reviewed, at the time of submission of Deliverable No. 5.

Deliverables 3, 4 and 5 shall be accompanied by in-person briefing for ARD and USAID as requested.

**E. Method of Report Submission:**

1. Five hard copies to be submitted;
2. Electronic copies of final report. Text should be submitted in MS Word format. Figures should be submitted in MS Excel format; photographs should be submitted in high-quality jpeg format

**F. Period of Performance:**

The schedule and LOE for the assignment is as follows:

Start Date: 27 August 2005

End Date: 30 September 2005

**F. Price and Payment Schedule**

Fixed Price Purchase Order (YASP 2005 –01): YER 1,375,921

The consultant is responsible for all costs required to complete this assessment and submit the above mentioned deliverables, including consultant fees, travel, per diem, and other direct costs.

1. First payment on submission and acceptance of deliverable 1;
2. Second payment on submission of deliverables 2 and 3;
3. Third and final payment on completion of deliverables, 4, 5 and 6.

**G. Qualifications:**

The candidate is expected to have the following qualifications and experience:

1. An advanced degree in horticulture, agriculture or related field.
2. Minimum 5 years practical relevant experience in the grape sector in Yemen.
3. Able to effectively communicate in both written and spoken Arabic; English language proficiency preferred but not required.

## ANNEX 2

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# The Assessment Team Tasks/Assignment



Name	Position
Talal A Al-Hosiny	Team Leader
Eng. Farouk Mohamed Kassim	Assistant Team Leader
Dr. Tarek K. Al-Agbary	Stat. Analysis specialist
1. Abdul-Galil A.S. Al Hemiri	Interviewer
2. Othman Al-Gabri	Interviewer
3. Abdolsalam Al ibi	Interviewer
4. Asad Heikal	Interviewer
5. Sa'adah (2)	Interviewer
6. Sa'adah (2)	Interviewer



# ANNEX 3

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## Questionnaires



**This annex contains the following:**

- **Farmers' Questionnaire**
- **Wholesaler's Questionnaire**
- **Consumer's Questionnaire**
- **Collective/Group Meetings Guideline**

**(1) Farmers' Questionnaire**

Questionnaire Form No.:-----

**Grapes Production and Marketing Study**

Name:	Governorate	District	Sub-District/ Center	City/Village

**Information about Data Collection and Review Officials**

Statement	Data Collector	Supervisor/Reviewer
Name:		
Signature		
Date	/ /2005	/ /2005

September 2005

## Data on Grape Production

**1. General information:**

- Local Measurement Unit Used:
- Local Unit = ----- m<sup>2</sup>

**2. Data on land tenure:**

Total area of acquisition:

The following table shows type of Acquisition and Irrigation Method

Type of Acquisition	Irrigated Area		Rain-fed Cultivated Areas
	Wells	Spate	
1- Rented Areas			
2- Owned Areas			
3- Cropsharing Areas			
4- Endowment Owned Areas			
5- Total Areas			

**3. Ownership of the well:** (a) Ownership ( ) (b) Partnership ( )

**4. Ratio of partnership in the well:** -----

**5. Rent/cost of the leased land:** -----

**6. Crop Sharing Land Partnership Method:**

- (a) Crop ( ) (b) One-Third ( ) (c) Half ( )

**7. Rent of irrigation per hour per area unit (specify a plot and its area):** -----

**8. Amount of irrigation for one cycle for a specified plot ( ) :** -----

**9. Do you face problems in grape cultivation?** Yes ( ) No ( )

9.1. If Yes, Please specify according to priorities.

1. ----- 2. -----  
 3. ----- 4. -----  
 5. ----- 6. -----

**10. When did you start harvesting grapes according to variety? (Month)**

Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other.....

**11. Was the grape harvest ample this year?**

Type	Yes	No	If No, Specify Reasons
Raziqi			
Aasmi			
Bayadh			
Aswad			
Gubari			
Other			

**12. Specify the market in which grapes are sold?**

12.1. Method or operations after harvest?

1. ----- 2. ----- 3. -----

**13. Data on the types and areas of the vineyards, ages of the trees, type of soil, quantity of production and unit price:**

No. of Plots	Type of Grapes	Area of Plot	No. of Trees	Age of the Tree	Time of Maturity		Quantity of Production	Selling Price at farm Y.R.
					Ripe	Total		
	Raziqi							
	Aasmi							
	Bayadh							
	Aswad							
	Gubari							
	Other							

**14. Do you wish to increase the area of grape vineyards? Yes ( ) No. ( )**

14.1. If no, what is the reason?

1. ----- 2. -----  
3. ----- 4. -----

**15. Method of Selling the Grapes? Fresh ( ) Dried ( )**

Fresh \_\_\_\_\_ Kg Dried \_\_\_\_\_ Kg

**16. What are the problems that are facing you in order of importance?**

Problems in Production					Priorities	Marketing Problems	Priorities
Land Tenure	Method of Partnership	Salinity	Lease			Sorting and Grading	
Water	Salinity	Value of Water	Scarcity of Water	Share of the Well		Packing	
Inputs Fertilizers	Available	Not Available	High Cost			Transport	
Pesticides	Available	Not Available	High Cost			Preservation (Storage)	
Crop Harvest	Unavail-ability of Labor	High Pilferage (Loss) Clarify		Late Maturity		Other	
Services	Loan	Agricultural Extension		Research			
Others							

**17. Do imported raisins affect production and marketing of Yemeni raisins?**

Yes ( ) No. ( )

**18. Do you export grapes or sell it to a merchant who exports grapes abroad?**

Yes ( ) No. ( )

19. What are the preferable and demanded varieties in the Domestic Market and Foreign Market?

Variety	Domestic Market		Foreign Market	
	Grapes	Raisins	Grapes	Raisins
Raziqi				
A'asmi				
Bayadh				
Aswad				
Jabri				

20. Is there an agricultural association? Yes ( ) No. ( )

21. Are you a member in the association? Yes ( ) No. ( )

21.1. If yes! Are you satisfied with it? Yes ( ) No. ( )

21.2. Type of Association: (a) Production ( ); (b) Services ( ); (c) Marketing ( ); (d) Multi-purpose ( )

21.3. If Yes! What is the Name of the Association?

22. What are the roles and services of the association?

Role/Functions of the Association	Services Provided to you by the Association

23. If marketing is through the association, what is the quantity of grapes you have marketed?

24. Type of Packing -----

25. How do you receive the cost of the crop? (a) In cash ( ); (b) Deferred payment ( ); (c) Specified percentage ( ); (d) Other ( )

26. Who specifies the price of the product/grapes?

(a) The association ( ); (b) Market price ( )

27. Is the crop yield ample this year?

27.1. If No! What are the reasons?

1. ----- 2. -----
3. ----- 4. -----
5. ----- 6. -----

28. Were the fruits all sound and intact? (a) High percentage damaged ( ); (b) Slight percentage damaged ( ).

28.1. If high percentage is damaged, what are the reasons from your point of view?

1. ----- 2. -----
3. ----- 4. -----
5. ----- 6. -----

29. How is the grape crop sold?

Method of Payment	Before Maturity	After Maturity
Bulk		
Individual		
Other		

29.1. If crop is sold before maturity, what are the reasons?

1. ----- 2. -----  
3. ----- 4. -----

30. Quantity and selling price of the grape crop unit?

Selling Places	Quantity and Price per Unit							
	Bayadh		Aasmi		Raziqi		Aswad	
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
1. In the Farm to Consumer								
2. In the Farm to Retailer								
3. In the Farm to Wholesaler								

31. Price of the grapes in the market is specified through?

(a) Farmer (); (b) Buying merchant (); (c) Broker (); (d) Other ()

32. Do you pay the commission of the Agent? Yes (); No ()

32.1. If Yes, What is the amount of Commission you are paying for each unit sold?  
-----

33. Do you pay a commission to the Broker? Yes (); No ()

33.1. If Yes, What is the amount of Commission you are paying for each unit sold?  
-----

34. Data regarding the operations/process involved to the crop during marketing:

- 34.1. What is the method of sale of the produced crop?  
(a) Packed (); (b) Without Packing (); (c) Other (); (d) Mention ()
- 34.2. Who does the packaging of the grapes?  
(a) Members of the family (); (b) Laborers ()
- 34.3. What market fees do you pay for each package? YR-----
- 34.4. For a Hilux vehicle? YR-----
- 34.5. How much do you pay to the Agent? (Y.R. Per Package) YR-----
- 34.6. How much do you pay to the Broker? (); Other () YR-----

35. Sorting and Grading:

Do you sort and grade grape crop after yield?

(a) Yes (); (b) No ()

**36. Storage:**

- 36.1. Did you store the grape crop last year?  
Yes (); No ()
- 36.2. What was the quantity stored? ()

Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other

- 36.3. What are the reasons for storage?  
1. ----- 2. -----
- 36.4. Where are the grapes stored?  
(a) In Special Rooms without air conditioning ()  
(b) In the House/Farm ()  
(c) In special air conditioned Stores ()
- 36.5. What is the period of storage?  
(a) One Week to Four Weeks ()  
(b) One Month to Two Months ()  
(c) Three to Four Months ()  
(d) Five Months and More ()
- 36.6. Did you discover any damaged/rotten grapes or loss in the crops during storage?  
Yes (); No ()
- 36.7. What is the cost of storage per unit of package of grapes per day, week or month?  
YR-----

**37. Transport and Shipment:**

- How are grape crops transported to the selling places?  
(a) By carrying it on shoulders ()  
(b) Carried on animals: “donkeys and camels” ()  
(c) By cars ()

**38. Marketing of Raisins:**

- (a) Do you consume raisins within the family? () or (b) Do you sale raisins? ()
- 38.1. If Sold, for whom do you sell it?  
(a) Direct to Consumer () in Kilos ()  
(b) Wholesaler or Retailers () Price per Kilo ()  
(c) Marketing Companies () Price per Kilo ()
- 38.2. Do you prefer selling the grape crop in terms of raisins or fresh grapes?  
Fresh (); Raisins ()

Type	Reasons
Grapes	
Raisins	

39. Do you export Yemeni grapes overseas? Yes () No ()

40. Do you export Yemeni raisins overseas? Yes () No ()

41. If export is exercised, is there any consideration to the internationally acknowledged specifications and standards; such as:

- (a) Sorting and Grading (); Packaging: Plastic, () Cartons (), Others () – Please mention-----  
(b) Net weight of the package: 20 Kilos (); 10 Kilos (); 5 Kilos (); 3 Kilos ()

42. Do you harvest and market grapes according to size, shape and quality?

	<b>Specifications</b>	<b>Yes</b>	<b>No</b>	<b>Why</b>
1	Size			
2	Shape			
3	Quality			

(2) Wholesaler's Questionnaire

Grapes Production and Marketing Study

Name:	Govern.	District	Sub-District/Center	City/Village

Information about Data Collection and Review Officials

Statement:	Data Collector	Supervisor/Reviewer
Name:		
Signature		
Data	/ /2005	/ /2005

September 2005

Location of the Market: -----

1. Crops of your trade:

(a) Fruits (); (b) Vegetables (); (c) Animals (); (d) Other crops ()

2. From where do you buy grapes according to type?

(a) From the supplier (); (b) From the farmer at the farm ();  
(c) From the farmer at the market (); (d) Buying contracts ()

Variety	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other

3. Do you purchase through the Agent? Yes () No ()

4.1. If Yes, how is the buying transaction conducted? -----

4. What is the commission you pay? (a) to the Agent -----; (b) to the Broker -----

(c) Others -----

5. What are the varieties you are buying?

Variety	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other

6. To whom do you sell the grapes?

Retailer	Markets of the Governorates	Export Overseas

7. Average purchase according to type?

Period/ Months	Raziqi		Aasmi		Bayadh		Aswad		Gubari	
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
Beginning of Season										
Peak of Season										
End of Season										

8. Average sale according to variety?

Period/ Months	Raziqi		Aasmi		Bayadh		Aswad		Gubari	
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
Beginning of Season										
Peak of Season										
End of Season										

9. What services are you providing?

Sorting and Grading	Warehouse/ Storage	Packing	Transport

10. Do you provide services to the clients? Yes ( ) No ( )

10.1. If Yes! What are the services?

- (a) Giving them Cash Loans ( ); (b) Giving them Loans for Inputs such as: \_\_\_\_\_;  
 (c) Pay the Cost in Advance ( )

11. What packing is used in the: Domestic Market: \_\_\_\_\_ Foreign \_\_\_\_\_

12. What are the means used for transport: Foreign \_\_\_\_\_ Local: \_\_\_\_\_

13. Preferable varieties:

Variety	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other
Foreign Consumer						
Domestic Consumer						

14. What are the problems that face you at time of buying? (According to priorities)

Problem	Priority

15. What are the problems that are facing you in marketing grapes?

Domestic Market	Foreign Market

(3) Consumer's Questionnaire

Grapes Production and Marketing Study

	<b>Govern.</b>	<b>District</b>	<b>Subdistrict/Center</b>	<b>City/Village</b>
<b>Name:</b>				

Information about Data Collection and Review Officials

<b>Statement:</b>	<b>Data Collector</b>	<b>Supervisor/Reviewer</b>
<b>Name:</b>		
<b>Signature</b>		
<b>Data</b>	/ /2005	/ /2005

September 2005

Consumer No.: -----

**1. Nature of Work**

(a) Civil Servant ( ); (b) Public Sector Employee ( ); (c) Laborer ( ); (d) Unemployed

**2. Did you purchase grapes of this season? Yes ( ) No ( )**

2.1. If Yes! How many times? during the month of \_\_\_\_\_

**3. What are the types of grapes you purchased?**

Variety	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other
Price						
Preferable Variety of Grapes						
Preferable Variety of Raisins						

**4. Do you purchase imported raisins? Yes ( ) No ( )**

4.1. If Yes ! What are the reasons?

(a) Cheap ( ); (b) Beautiful Shape ( ); (c) Delicious Taste ( )

4.2. If No ! What are the reasons?

1. ----- 2. -----

3. ----- 4. -----

**5. What are the deficiencies of the Yemeni grapes and raisins?**

Type	Quality	Taste	With Seeds	Damage	Shape	High Cost	Others
Grapes							
Raisins							

#### (4) Collective/Group Meetings Guideline

No. of Attendants ( )

#### Grapes Production and Marketing Study

Name:	Governorate	District	Subdistrict/ Center	City/Village

#### Information about Data Collection and Review Officials

Statement:	Data Collector	Supervisor/Reviewer
Name:		
Signature		
Date	/ /2005	/ /2005

September 2005

No. of Farmers/traders: --- ----

1. What are the varieties that are cultivated in the region?

Type	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other
Area						

2. What are the types of grapes and raisins that are preferable in the Domestic Markets and Exports?

Type	Raziqi	Aasmi	Bayadh	Aswad	Gubari	Other
Grapes						
Raisins						
Domestic Market						
Export						

3. What are the obstacles and problems that are facing you in marketing? (Describe according to priority)

Problem	Priority

4. Is there an expansion in cultivation of grapes? Yes ( ) No ( )

4.1. If Yes, Why?

1. -----
2. -----
3. -----

4.2. If No, Why?

1. -----
2. -----
3. -----



# ANNEX 4

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## References



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# ANNEX 5

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## Persons Interviewed



<b>Name</b>	<b>Title</b>	<b>Organization/Region</b>
Jawad Nasser Al-A'arifi	Chief of Agricultural Affairs Directorate	Agricultural Cooperative Union
Mohamed Abdul Malik		Agricultural Cooperative Union
Qais Yahya Hussain Al-So'ola	Director of Media and Training Directorate	Agricultural Cooperative Union
Dr. Mana'e Al-Hazmi	Chief of Horticulture Division	Faculty of Agriculture University of Sana'a
Abdul Aziz Al-Asbahi	Director of Information and Marketing Unit	Amran Governorate
Nejib Mohamed Ali	Director of Extension Complex	Dhib Been, Amran Governorate
Ahmed No'aman Al-Dua'is	Deputy Governor	Sa'adah Governorate
Abdulla Rajeh	Director of Agriculture Office	Sa'adah
Faisal Mohamed	Director of Agricultural Extension	Sa'adah
Abdullah Al-Wade'l	Director of Agriculture Affairs	Sa'adah Ministry of Agriculture and Irrigation Office
Abdullah Al-Ja'afari	Director of Plant Protection	Sa'adah Ministry of Agriculture and Irrigation Office
Saleh Muthanna	Assistant Deputy Minister for Agriculture Affairs	Ministry of Agriculture and Irrigation
Abdul Hafiz Qarhash	Director General of Plant Production	Ministry of Agriculture and Irrigation, Sana'a
Ali Majdi	Director of Plant Quarantine	A'alb Center for Export Preparation, Sa'adah Governorate
Yahya Mohamed Al-Katayri	Deputy Director of Plant Quarantine	A'alb Center for Export Preparation, Sa'adah Governorate
Mohamed Ahmed Hadi	Director of Customs	A'alb, Sa'adah
Ahmed Sheikh	Director of Monitoring and Evaluation	Eastern Region (Marib and Al-Jawf) Development
Ahmed Al-Eshla	Director General of Agriculture Office	Shabwah Governorate
Hajer Hamad Mohamed	Deputy Director General of Customs	A'alb Center, Sa'adah Governorate
Various owners of refrigeration units		Sa'adah Governorate
Employees of YECF who work in refrigeration units		Yemeni Economic Corporation for Fruits (YECF) Storage

# ANNEX 6

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## Supportive Tables

**TABLE A. FINDINGS OF THE GROUP<sup>9</sup> MEETING**

Governorate	Grape varieties	Grape varieties grown in the area	Preferred varieties				Problems/ Constraints
			Local		Outside		
			Fresh	Dried	Fresh	Dried	
Sana'a	Bayadh	✓	✓	✓		✓	1. Water shortage, 2. Disease and pests, 3. Marketing
	Aasmi	✓	✓				
	Raziqi	✓	✓	✓			
	Aswad	✓	✓	✓	✓	✓	
	Erqi	✓					
	Gubari	✓					
	Zeituni	✓					
	Attraf	✓					
	Others						
Sa'adah	Bayadh		✓				1. Marketing, 2. Water shortage, 3. Disease and pests, 4. Agricultural inputs
	Aasmi	✓	✓		✓		
	Raziqi	✓		✓	✓	✓	
	Aswad	✓	✓	✓	✓	✓	
	Others: American	✓					
Amran	Aswad	✓					1. Water shortage, 2. Disease and pests, 3. Marketing, 4. Agricultural inputs
	Erqi						
	Gubari	✓	✓	✓	✓	✓	
	Zeituni						
	Attraf						
	Others: Bakely						

<sup>9</sup> "Group" refers to an informal gathering of farmers, grape producers, traders, and wholesalers organized by the consultants.

**TABLE B. MORPHOLOGICAL CHARACTERISTICS, DILUTED GLUCOSE AND MATURATION OF THE MOST IMPORTANT VARIETIES OF GRAPES**

Variety	Area of Cultivation	Cluster	Color and Shape of the Fruit	Taste and Diluted Glucose	Mature Time	Uses
<b>Bayadh</b>	Sana'a – Amran – Sa'adah	Big size – conical shape - length 18-26 cm	White – elliptical, circular, without seeds	Sweet – delicious in taste; ratio of glucose 22%	July – August	Table grapes and raisins
<b>Aswad</b>	Sana'a – Amran – Sa'adah	Big size – conical shape - length 18-26 cm	Black – big size – elliptical – pink juice – big seeds	Ratio of glucose reaches to 20%	August	Table grapes and raisins (one of best qualities)
<b>Raziqi</b>	Sana'a – Amran – Sa'adah	Big size – conical shape - Length 26 cm	White, elliptical shape	Sweet taste, glucose ratio 18%	July	Table grapes and raisins (one of best qualities)
<b>Aasmi</b>	Sana'a – Bani Husheish – Rawdah – Bani Al-Hareth – Sa'adah	Very big – length more than 30 cm - conical shape	Pink in color, big, ball shaped, has seeds	Very sweet with special flavor, ratio of glucose 10%	Late September	Fresh table grapes
<b>Erqi</b>	Sana'a	Big size and conical shape	White, big, medium-size seeds	Good and sweet; ratio of glucose 20%	August	Fresh table grapes, juice with addition of some black or Hatemi grapes for color
<b>Hatemi</b>	Sana'a	Big size – conical shape – length 18-26 cm	Black ball, slightly elliptical in shape, medium-size seeds	Very sweet when matured	July	Fresh and dried

*Source: Agriculture Research Station – Taiz – Ministry of Agriculture and Irrigation -Republic of Yemen Dr. Haitham Mustafa Al-Sawaf, September 1981.*

**TABLE C. RESPONSES REGARDING GRAPE HARVESTING TIME**

Month	Grape varieties											
	Sana'a					Sa'adah				Amran		
	Bayadh	Aasmi	Raziqi	Aswad	Gubari	Bayadh	Raziqi	Aswad	Gubari	Gubari	Bayadh	Aswad
May										2		1
June						1	4	7	3	3	1	
July	9	1	3		2	11				3	1	
August	6	7	5	2		1		6		18		
September		5	5	11				4		1		
October				1								
<b>Total</b>	<b>15</b>	<b>13</b>	<b>13</b>	<b>14</b>	<b>2</b>	<b>13</b>	<b>4</b>	<b>17</b>	<b>3</b>	<b>27</b>	<b>2</b>	<b>1</b>

Source: field survey

**TABLE D. AVERAGES OF AREA, PRODUCTION, AND PRODUCTIVITY FOR GRAPES DURING PERIODS 1991-1993, 1996-1998, AND 2001-2003**

	1991 -1993	1996 - 1998	2001 - 2003
Area (ha)	18,433.3	21,500.3	22,779.3
Production (tons)	142,403	134,380	165,376.
Productivity (tons/ha)	7.725	6.25	7.26



## ANNEX 7

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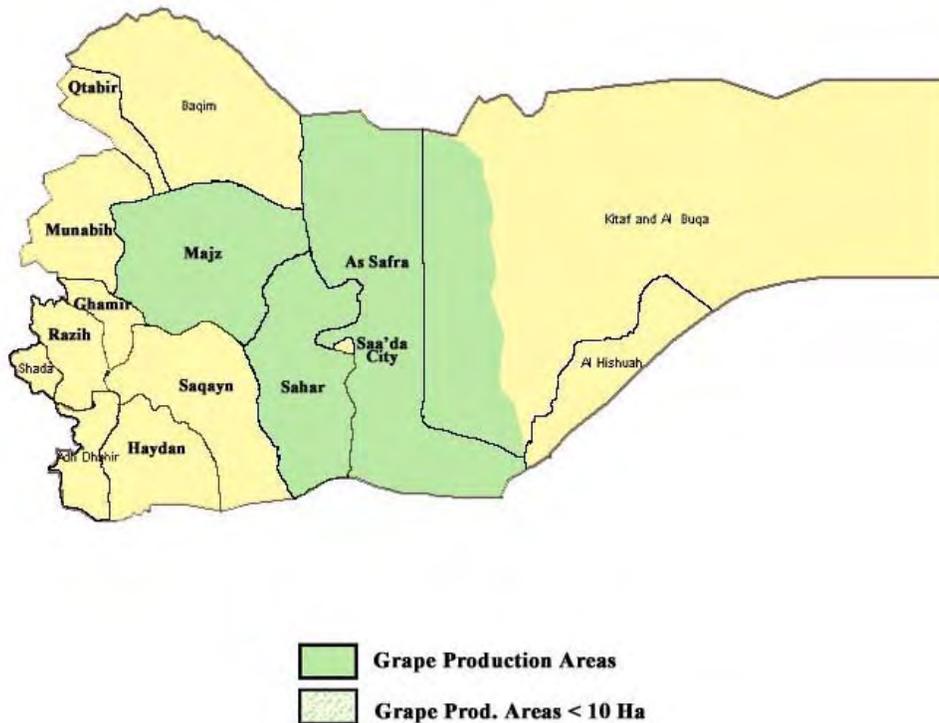
# Maps of Grape Production Areas



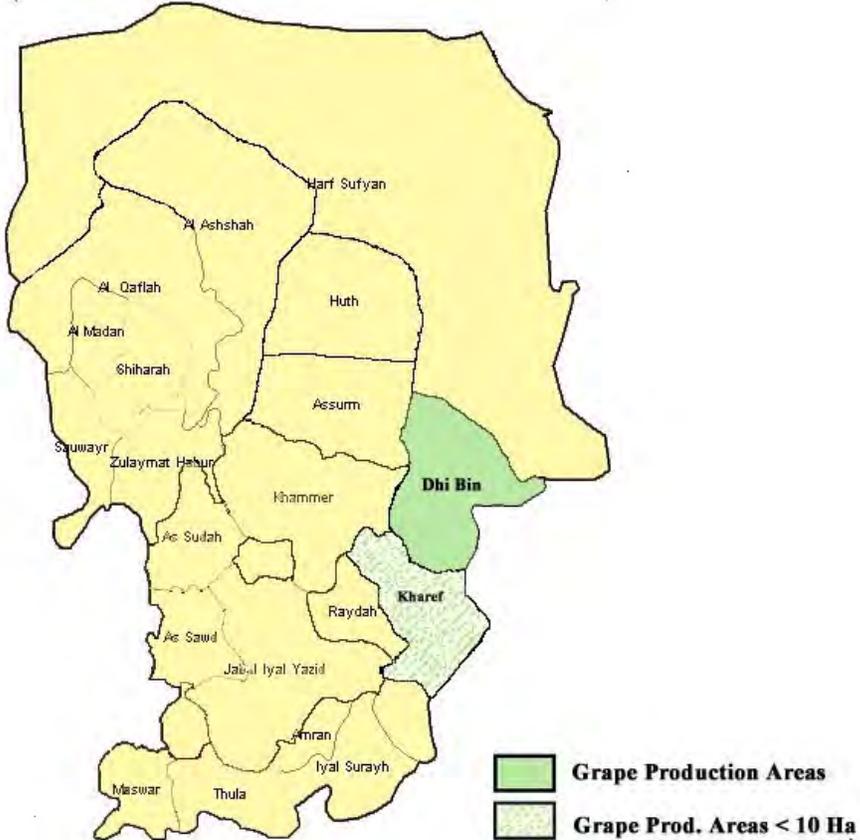
**FIGURE A. GRAPE PRODUCTION AREAS IN SANA'A GOVERNORATE**



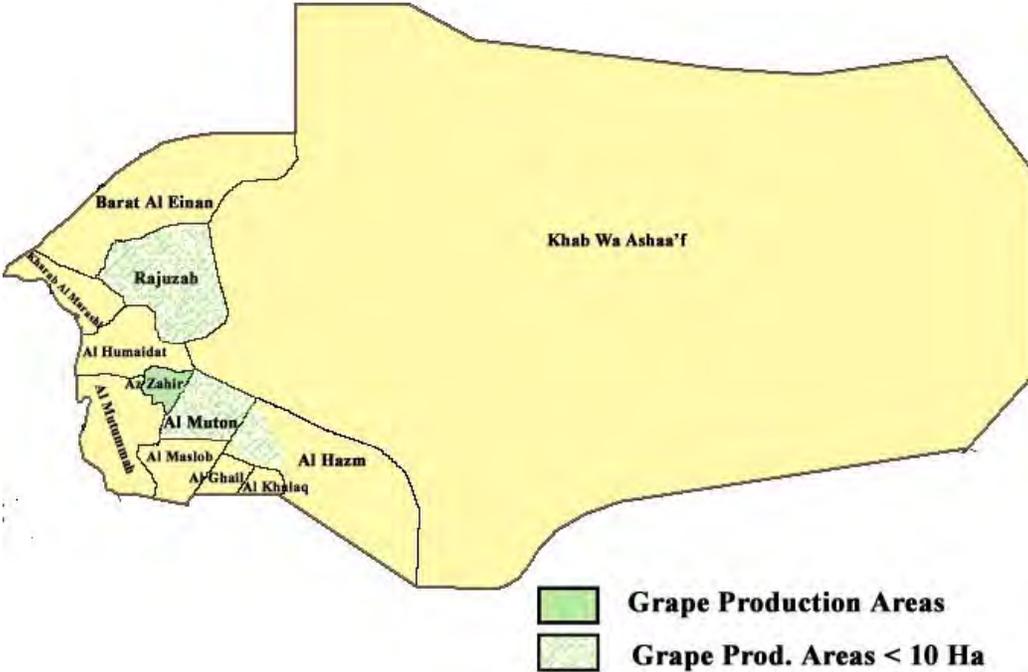
**FIGURE B. GRAPE PRODUCTION AREAS IN SA'ADAH GOVERNORATE**



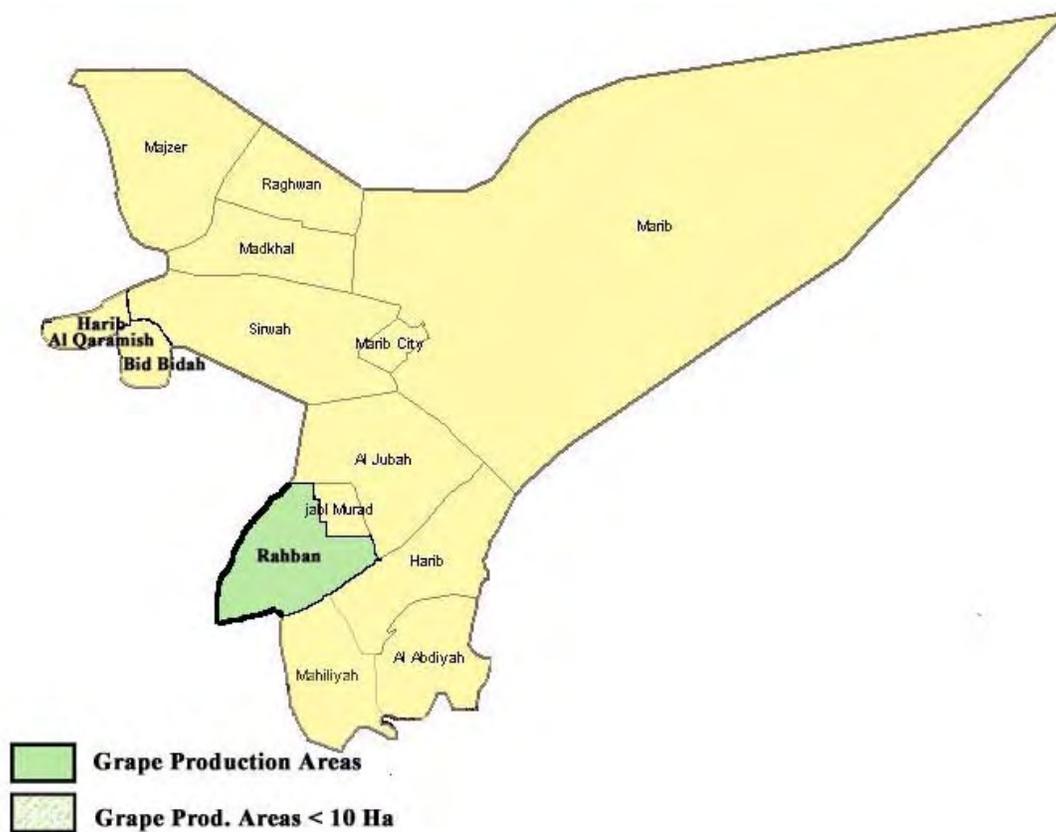
**FIGURE C. GRAPE PRODUCTION AREAS IN AMRAN GOVERNORATE**



**FIGURE D. GRAPE PRODUCTION AREAS IN AL-JAWF GOVERNORATE**



**FIGURE E. GRAPE PRODUCING AREAS IN MARIB GOVERNORATE**







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