

## Food Production, Irrigation, Marketing, and Agricultural Coping Mechanisms

Tihama (Wadi Zabid and Wadi Siham)



# Introduction

---

Agriculture in the Tihama region, being the main sustenance of the population, has been majorly influenced by the serious disruptions the agricultural sector is experiencing. The current war has negatively affected the productivity and investment capacity of the country. The supply and distribution of agricultural inputs and farm products to the markets have also been adversely affected. Affected people's coping mechanisms and safety nets of food security are stretched to the limit as families adopt insufficient and negative coping strategies in order to survive.

WEC in collaboration with the Flood-Based Livelihoods Network (FBLN), NICHE-Yem027 and MetaMeta Research conducted an operational research to assess the impact of the current war on food security, as well as understand the manifestation and causes of the famine and food insecurity in the Tihama plain, historically known as the food granary of the country. The selection of the study areas in the southern and central parts of the region of the Tihama Plain came to determine the impacts of war on household's food security and agricultural production in these regions. This study focused on Wadi Zabid (as southern wadi of the plain) and Wadi Siham (central wadi of the plain), where farming mainly depends on spate irrigation in which use is made of short duration floods in the dry streams.

The main objective of this assessment study was to quantify the impact of the ongoing war on food security to support the efforts of the international community to pursue their assistance for the affected poor and vulnerable population in Tihama, as well as best understand how to respond. It evaluates the food insecurity situation from two perspectives, the farmer's and the consumers', by understanding the challenges posed to establishing food security. The study also explored the direct and indirect impacts of war on food security and agricultural activities, while evaluating how those activities are in relation with food security and production. It eventually looked into coping strategies adapted by farmers and other water users, and any possible innovated simple solutions that they may be adopted to relief negative consequences on food security and thus ultimately on the livelihoods of the people. This note presents the findings concerning food security from the **farmer perspective**.

## The Tihama



Al-Hodeidah is the second largest governorate in Yemen in terms of population size. It has a population of about 3.19 million inhabitants, accounting for a percentage of 11.5% of the total Yemeni population. Al-Hodeidah is the main

governorate in the Tihama region, representing more than 80% of Tihama's region area.

Wadi Zabid is one of Tihama's main wadis located in its southern part (Figure 1). It is the second largest wadi in the spate spate-flowed Tihama, with an area of 4639 km<sup>2</sup>, while the catchment of Wadi Siham is located in the central part of Tihama (Figure 1), with an area of 5586 km<sup>2</sup>.

There are two agricultural seasons in both Wadi Zabid and Wadi Siham: the autumn season (July–October), and the summer season (March – June). The main crops grown in Wadi Siham during autumn are sesame and sorghum. Sorghum is grown for the purpose of producing grain and fodder. In the summer season, sorghum and millet are grown and irrigated using rainwater (spate irrigation), whereas, tobacco and vegetable crops are grown and irrigated using groundwater.

# Food Production, Irrigation, Marketing, and Agricultural Coping Mechanisms

## General Outlook

Over 70% of population is living in rural areas in Yemen and about 50% of the labor depends on agriculture and its related activities for their living. Agricultural production is estimated to cover about 25% of the crop-based food needs. Households in Tihama suffer from being unable to purchase the already insufficient agricultural production the two wadis are encountering due to the war.

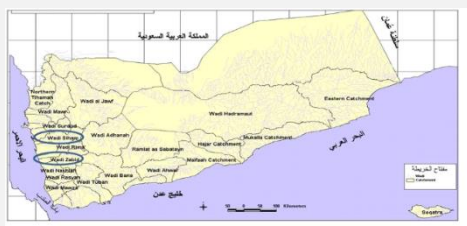
The war in Yemen has resulted in a shortage in water for irrigation compiled with a lack of production inputs (e.g. fertilizers, pesticides and improved varieties), and has created two types of water shortages: 1) due to the lack of maintenance for the spate irrigation infrastructure, leading to a reduction in the availability of floodwater for beneficial use; and 2) due to the significant increase in fuel prices – forcing farmers to pump less groundwater.

Additionally, almost all sharing rent lands in Wadi

Siham were abandoned. Reduction of access to agricultural lands was assessed to mainly be due to the unaffordability of paying the rent of land due to economic impairments.

On the other hands, the destruction and damage of cold storages and the means of transportation, in addition to the shortage of diesel and the blockage of roads have hindered families and farmers from marketing and exporting their products during the war. While the high cost of transportation and poor purchasing power of consumers have forced many families to sell their products locally only at cheaper prices.

Finally, for farmers to adapt with the alterations and water shortages resulted by the war, three main strategies were applied in the two wadis' areas (upstream, midstream and downstream): reducing irrigation hours; reducing the crop area; and excluding some crops.



## Baseline - Tihama

**Main governorate:** Al-Hodeidah

**Governorate population:** 3.19 million

**Governorate area ratio in the Tihama:** 80%

**Location:** Wadi Zabid is in the southern part of Tihama, while Wadi Siham is in the central part.

**Area:** Wadi Zabid (4639 km<sup>2</sup>), Wadi Siham (5586 km<sup>2</sup>).

## Key Findings

### Socio-economic situation

Turmoil in the livestock and agriculture production sectors; a decline and instability in the monthly income of farmers (food producers); and a collapse in the land rental market

### Food production

A 28-44.54% decline in all kinds of crop production in all wadis' areas; suspension of all groundwater-related agriculture; and a complete suspension of vegetable production in up- and downstream areas of Wadi Siham

### Irrigation

Shortage in irrigation water compiled with a lack of production inputs

### Marketing

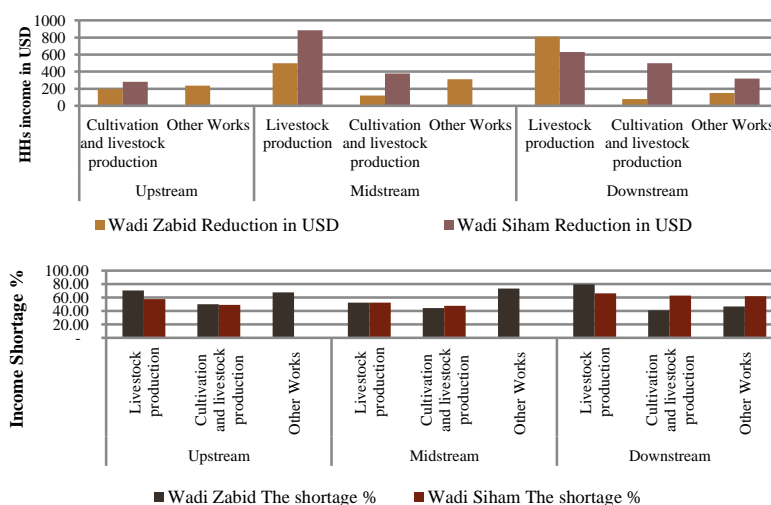
Resulted obstacles and constraints obstructing farmers from marketing their products

# The Crisis Impact\*

## Key figures (socio-economic situation)

A summary of the impact of the current war on the agricultural sector includes: Suspension of basic O&M services by the concerned institutions and low operating and investment budgets; suspension of all types of supports provided to farmers; declination of agricultural product exports and imports; and reduction in the availability of water for agricultural uses due to the huge damage in water structures and facilities, restriction of water tankers movement and high prices of diesel required to pump groundwater for agricultural irrigation.

### Monthly average reduction (USD) and percentage of the household income during the war



### Percentages of land holding's area reduction (ha) in both Wadis (Zabid and Siham) during the war

Wadi		Wadi Zabid			Wadi Siham		
Area		Upstream	Midstream	Downstream	Upstream	Midstream	Downstream
Owner holder	< 2 hectare	- 4.7%	+ 2.4%	+ 2.4%	+ 13.6%	- 38.6%	-
	2 -4 hectare	0%	-	-	- 28.3%	+ 1.1%	- 12.7%
	4- 8 hectare	0%	-	0%	+ 31.1%	+ 2.2%	-
Rent	< 2 hectare	-	-	-	0%	-	-
	2 -4 hectare	- 50%	-	-	-	-	- 7%
	4- 8 hectare	-	-	- 64.3%	+ 27%	-	+ 59%
Sharing rent	< 2 hectare	0%	0%	0%	- 60%	- 20.0%	- 20.0%
	2 -4 hectare	- 1.1%	- 7.1%	+ 21.4%	- 60%	- 20.0%	- 20.0%
	4- 8 hectare	+ 1.2%	+ 4.7%	- 6%	0%	- 100.0%	0%

## Agricultural damages (by respondent answers)

	Wadi Zabid	Wadi Siham
Water scarcity caused by destruction of water structures (dams, wells, reservoirs)	5.3 percent	34.9 percent
Inefficient performance of water installations due to lack of maintenance	31.9 percent	36.1 percent
Reducing the agricultural yields as a result of increasing the fuel prices for irrigation water pumps	50 percent	57.8 percent
Suspending the farmer support (financial-extension)	38 percent	37.3 percent
Increased prices of agricultural inputs due to the economic blockade	40.4 percent	68.7 percent
Difficult marketing for agricultural and craft products	22.3 percent	30.1 percent
Deterioration in livestock production	47.9 percent	74.7 percent

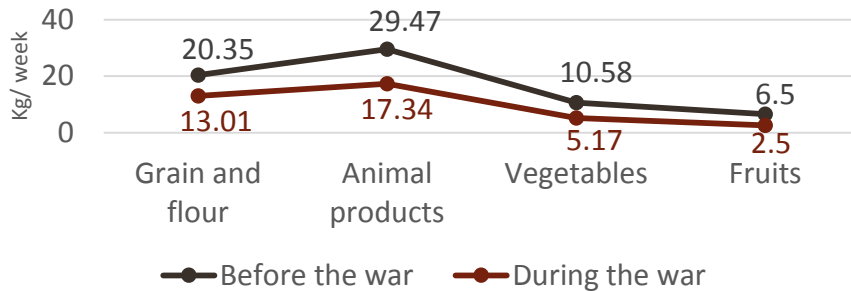
\* Study analysis covers the periods: March 2015 - June 2017, and the 'pre-war' period



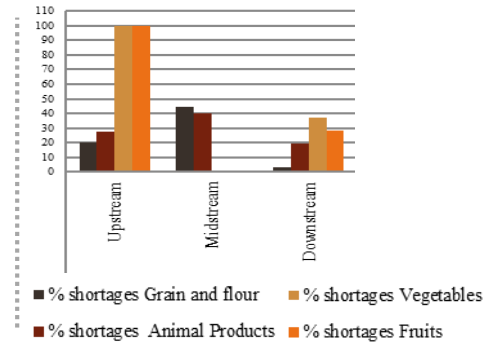
# Food Production

## Wadi Zabid

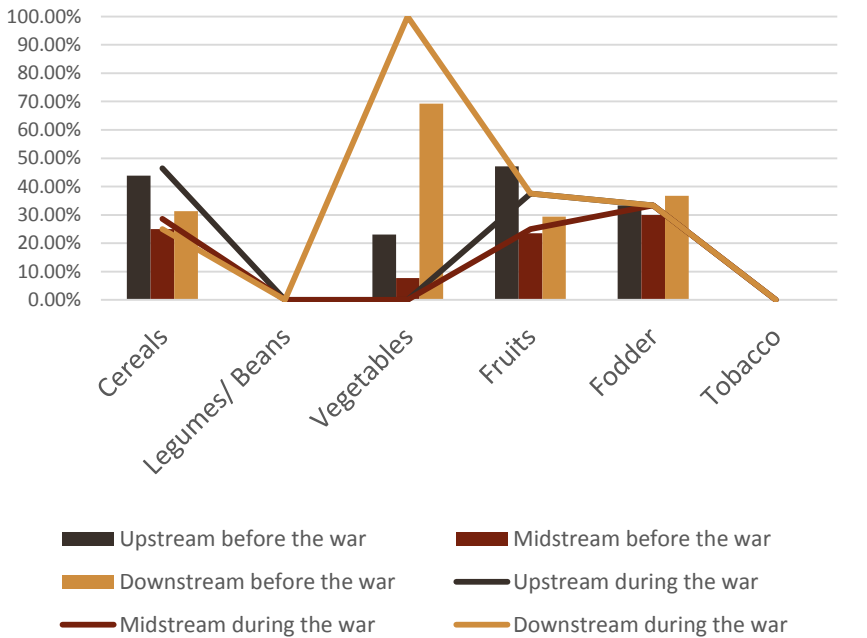
Pattern of the average change of food produced by households before and during the war (kg / week)



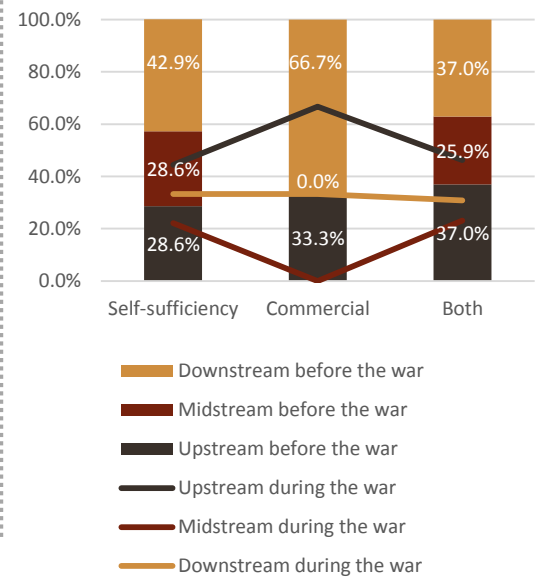
Percentage of family food production shortage



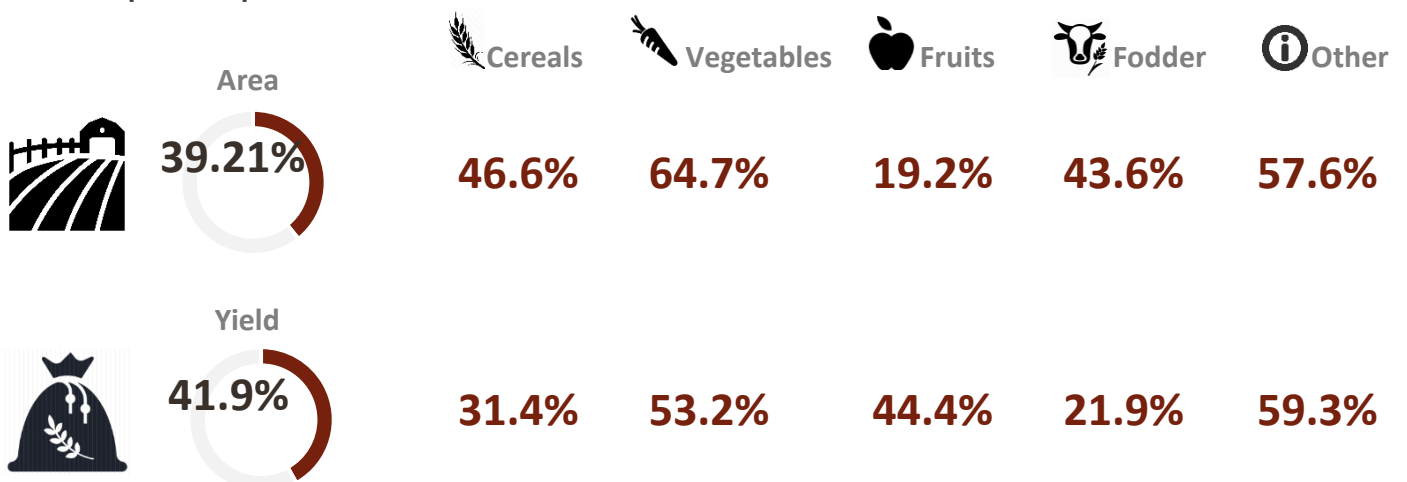
Types of crops grown by the family before and during the war



Agricultural production pattern before and during the war



Average percentages of shortages in crop area (ha) and in productivity and yield (ton/ha) compared to the pre-war period

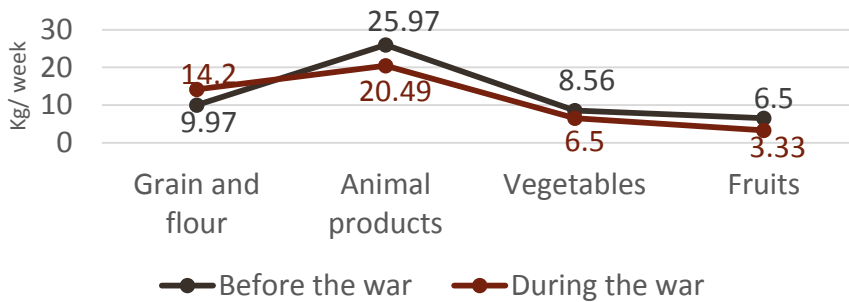




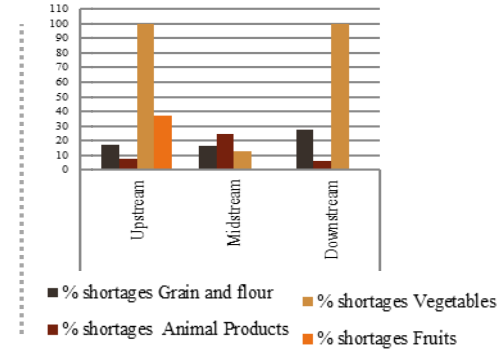
# Food Production

## Wadi Siham

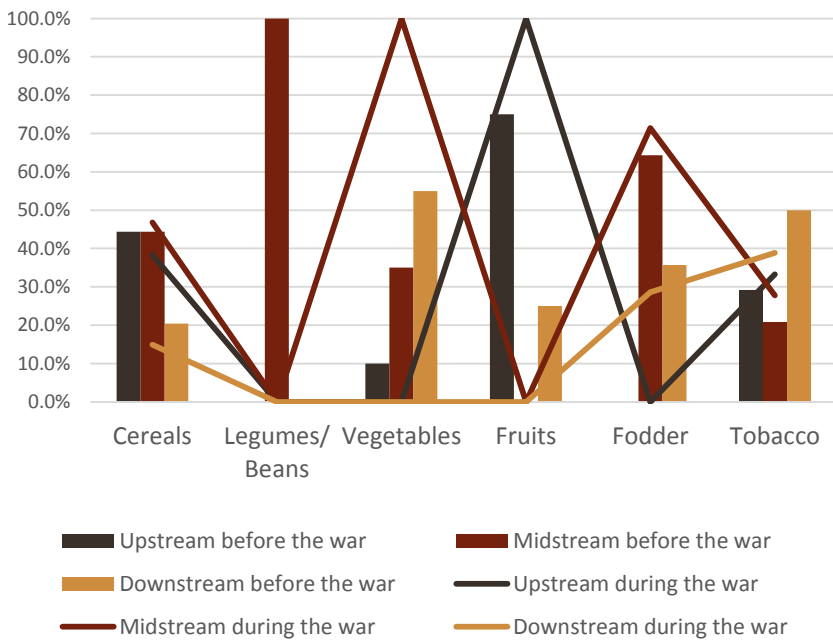
Pattern of the average change of food produced by households before and during the war (kg / week)



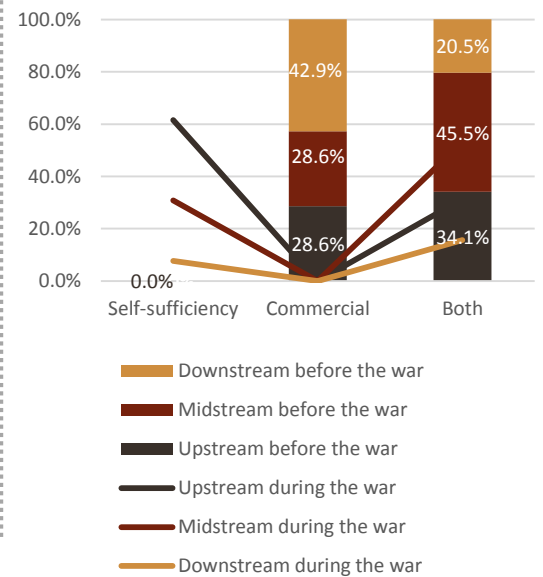
Percentage of family food production shortage



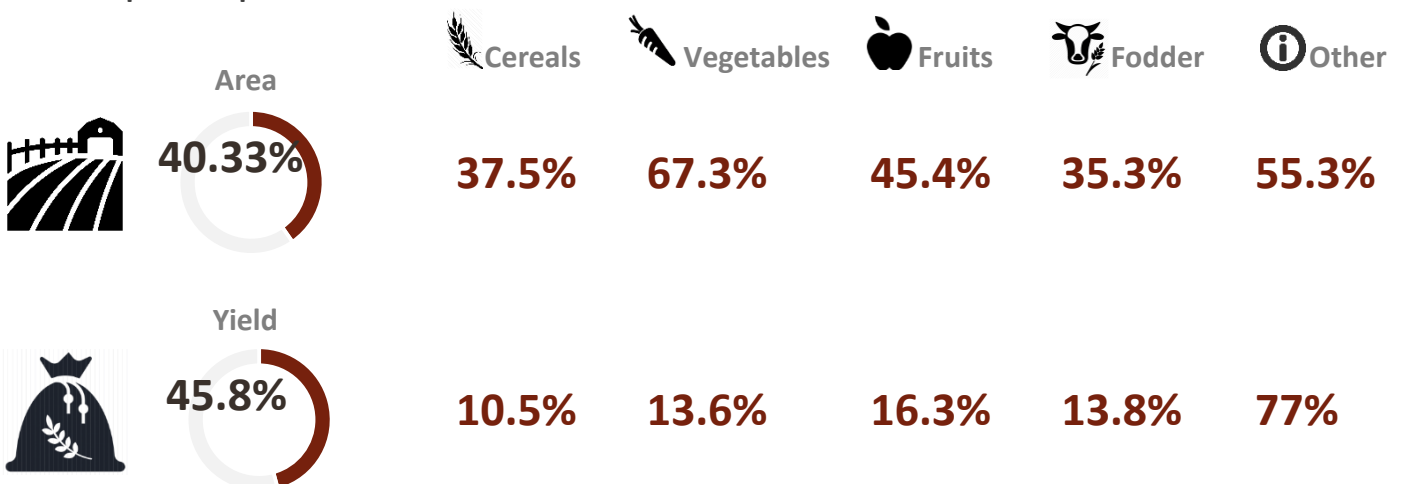
Types of crops grown by the family before and during the war



Agricultural production pattern before and during the war



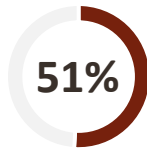
Average percentages of shortages in crop area (ha) and in productivity and yield (ton/ha) compared to the pre-war period





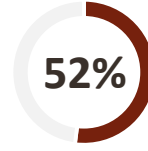
## Irrigation

The war impact on agricultural irrigated lands



Pre-war cultivated area reduced from 3896ha to 1908ha

Wadi Zabid



Pre-war cultivated area reduced from 4688ha to 2222ha

Wadi Siham

### Percentages of households (HHs %) and their food availability situation

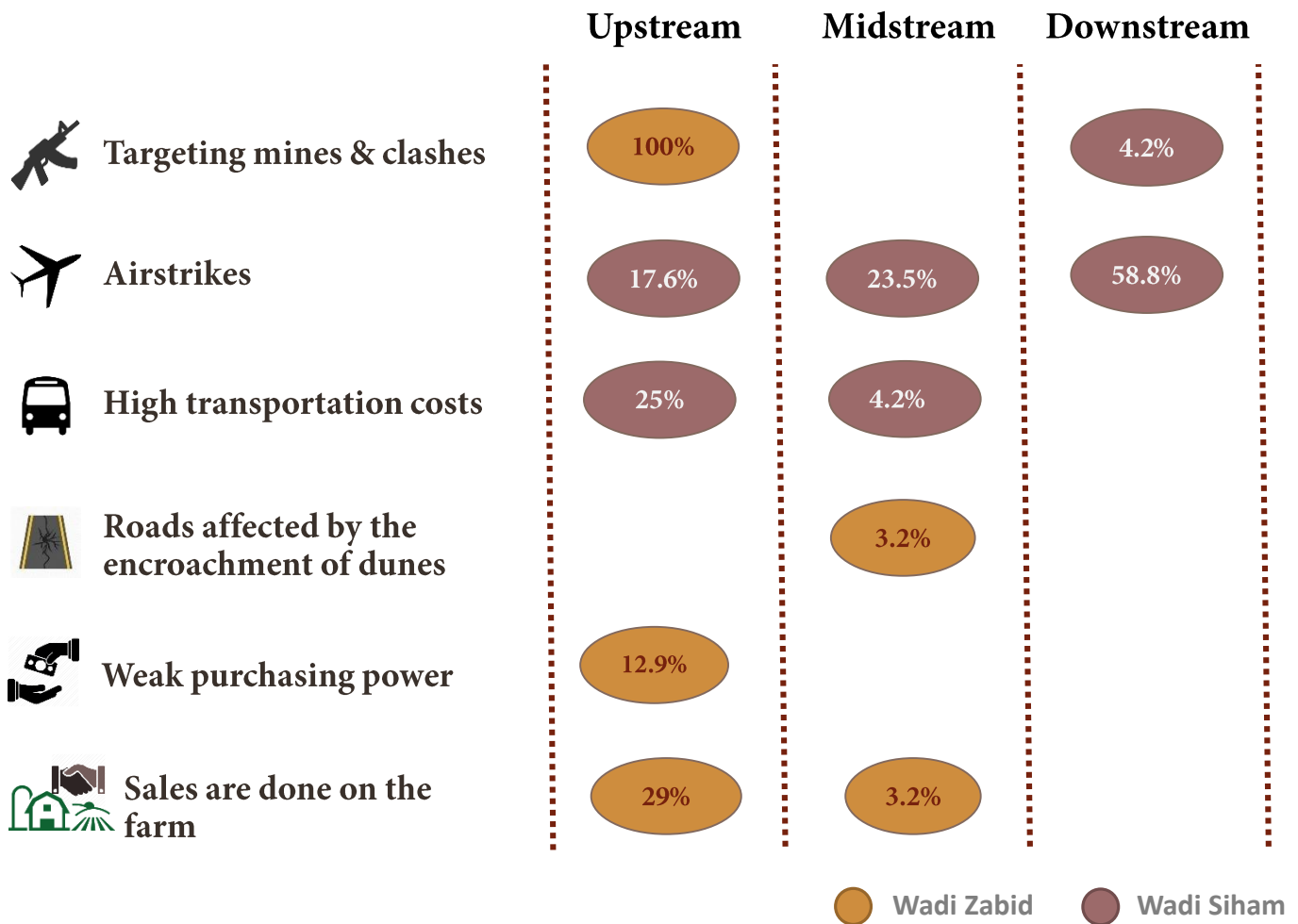
Crop	Type of irrigation / region	Wadi Zabid			Wadi Siham		
		Up	Mid	Down	Up	Mid	Down
Vegetables	Spate or wells irrigation			100.0%			
	Complementary irrigation			13.6%	4.5%	22.7%	59.1%
Cereals	rain-fed				44.4%	51.9%	3.7%
	Spate or wells irrigation			38.1%		19.0%	42.9%
	Complementary irrigation	57.7%	23.1%	19.2%			
Fodder	rain-fed				34.4%	56.3%	9.4%
	Spate or wells irrigation			100.0%			
	Complementary irrigation	19.6%	13.0%	10.9%	8.7%	34.8%	13.0%
Sesame	Spate or wells irrigation			42.9%			57.1%
	Complementary irrigation	33.3%	33.3%	33.3%			
Cotton	Spate or wells irrigation			43.8%			56.3%
	Complementary irrigation	25.0%		75.0%			
Fruits	rain-fed			100.0%			
	Spate or wells irrigation			50.0%	50.0%		
	Complementary			15.4%	84.6%		
Banana	Complementary irrigation	100.0%					
Mango	Spate or wells irrigation					91.7%	8.3%
	Complementary irrigation	55.6%	44.4%				
Qat	rain-fed					91.7%	8.3%
	Complementary irrigation					91.7%	8.3%



# Marketing (Wadi Siham)



## Constraints that limit farmers from marketing their products







# Coping Mechanisms & Adaptation Strategies

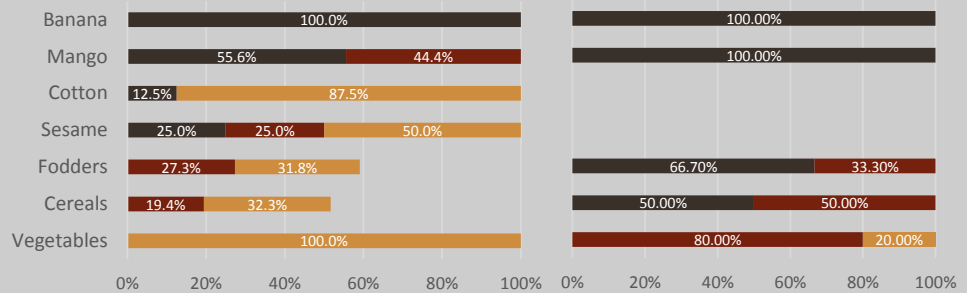
## Agricultural coping mechanisms to tackle water shortage

### Strategy

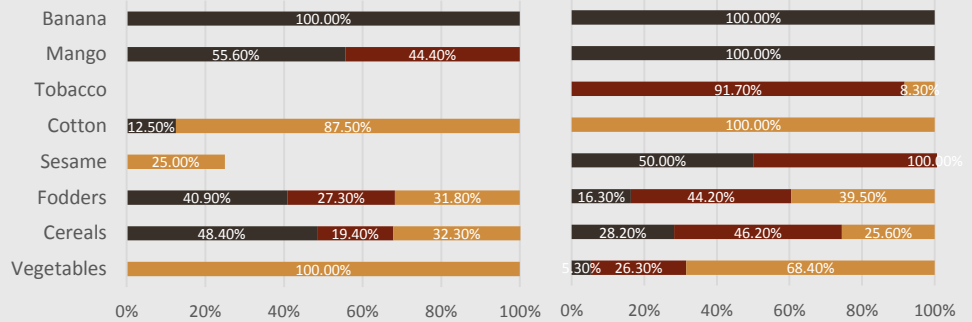
### Wadi Zabid

### Wadi Siham

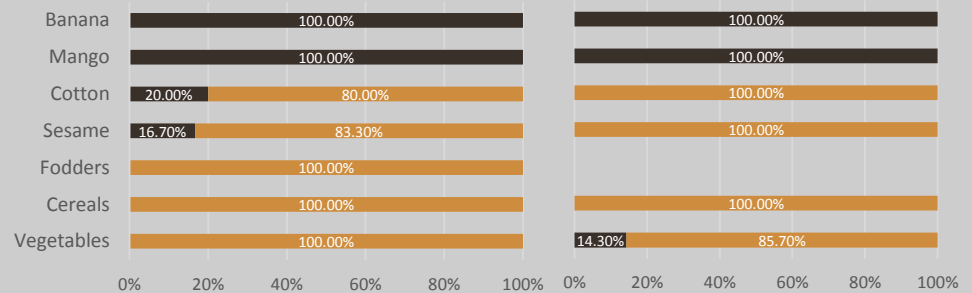
#### Reducing irrigation hours



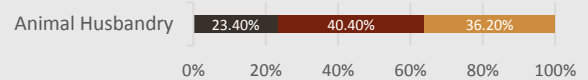
#### Reducing crop area



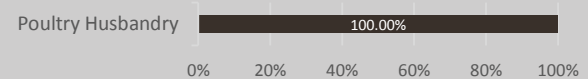
#### Excluding crops



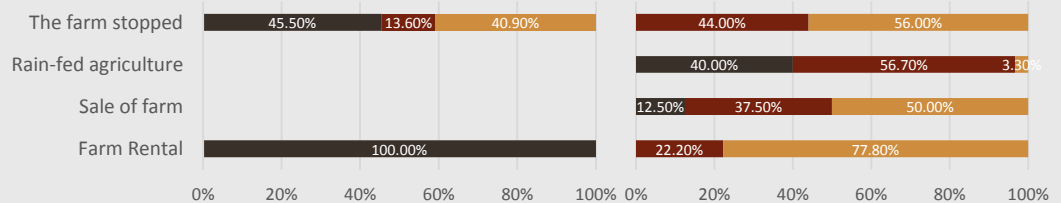
#### Animal breeding



#### Poultry and birds



#### Other actions



Upstream
  Midstream
  Downstream

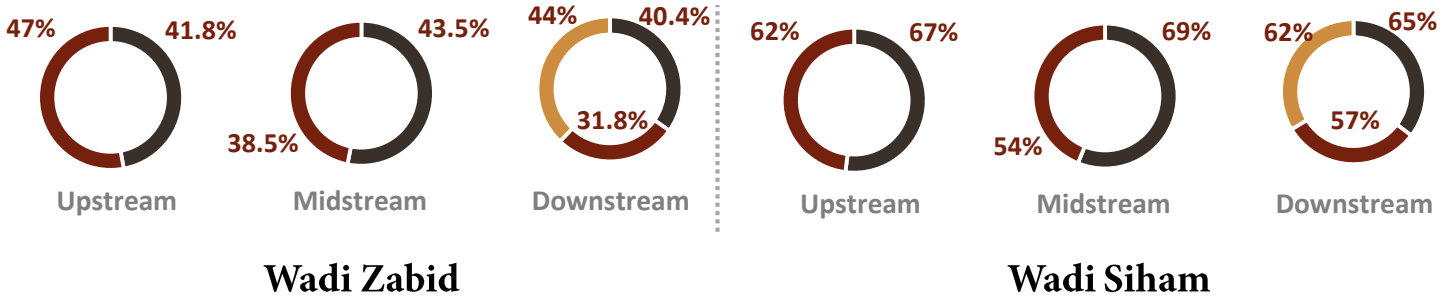


# Coping Mechanisms & Adaptation Strategies

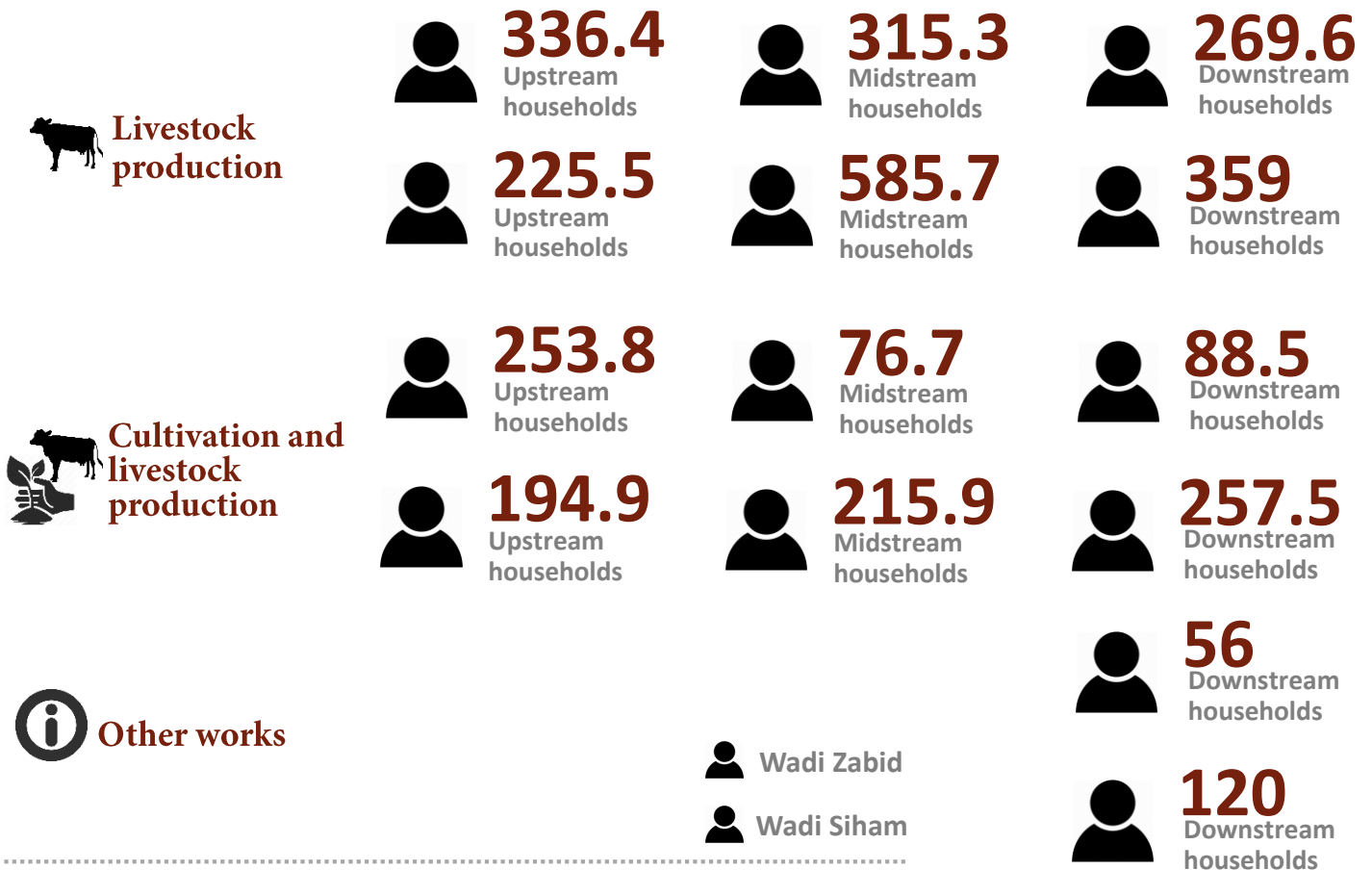
## Reducing the monthly expenditure (percentage and amount)



Percentage of the shortage in the monthly average of the household expenses during the war compared to the pre-war period to cope with the food insecurity situation and the increasing prices



Monthly average of the household expenses reduction during the war (USD)



Restoring agricultural production (farmer's proposed recovery strategies and solutions)

