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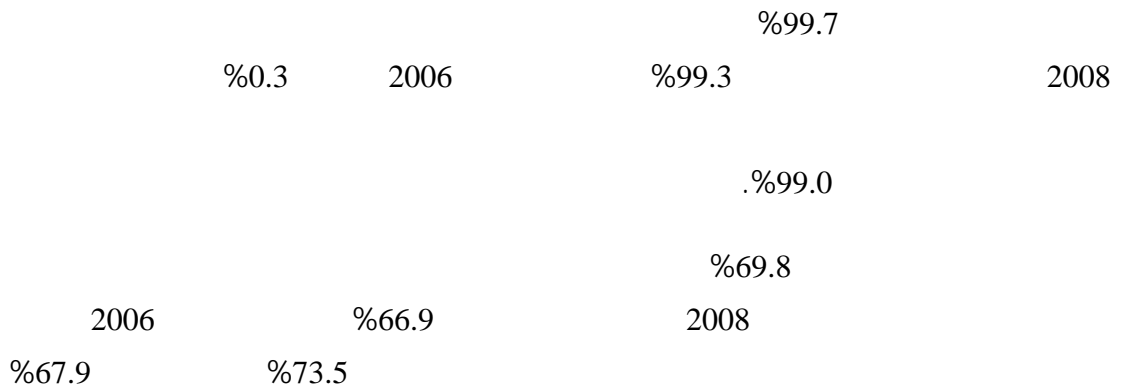
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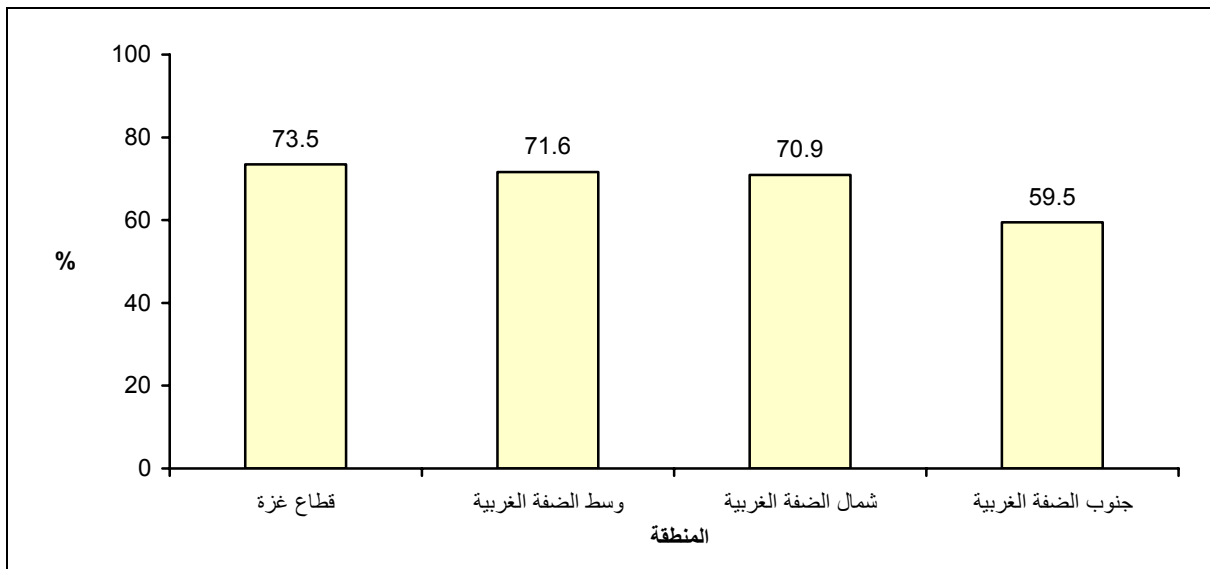
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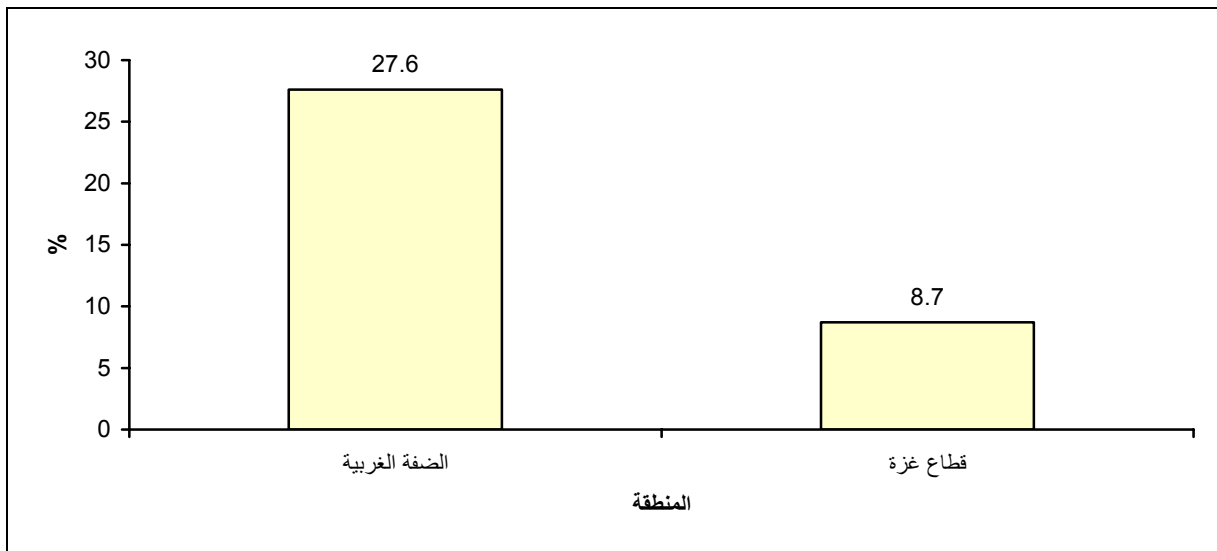
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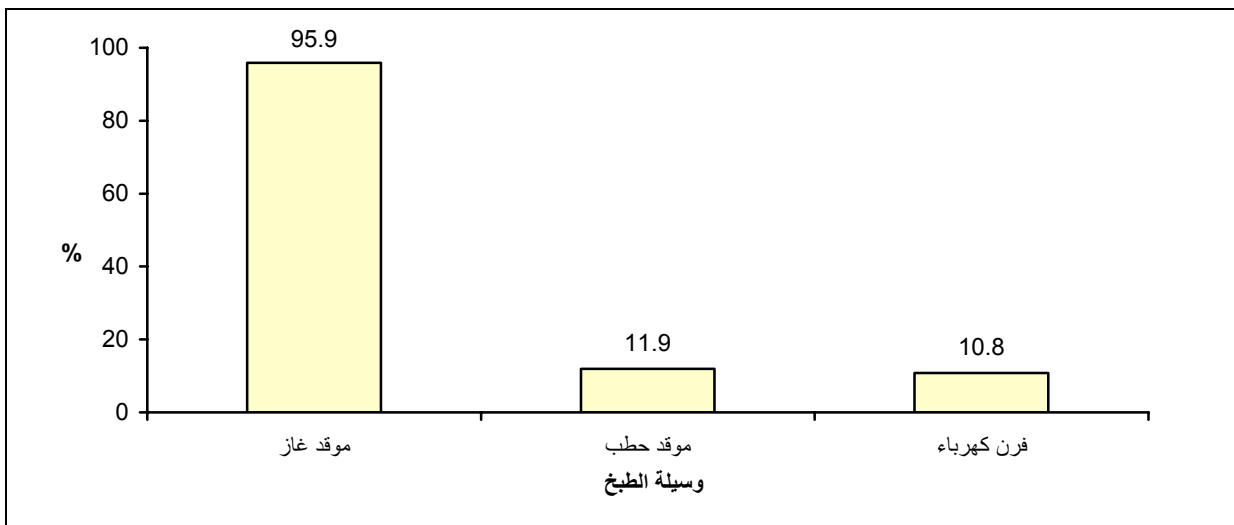
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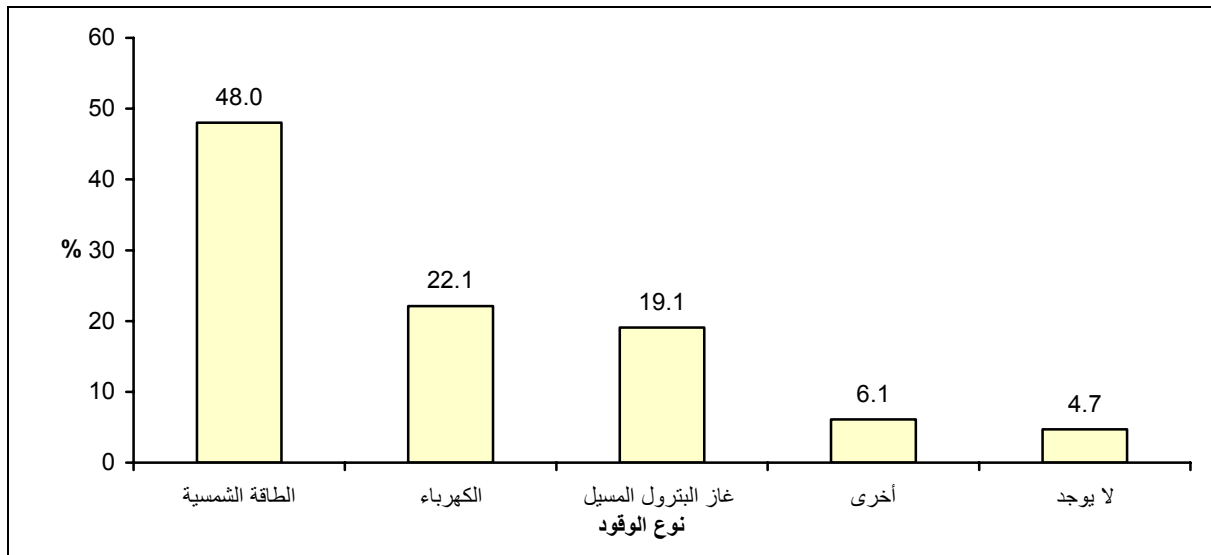
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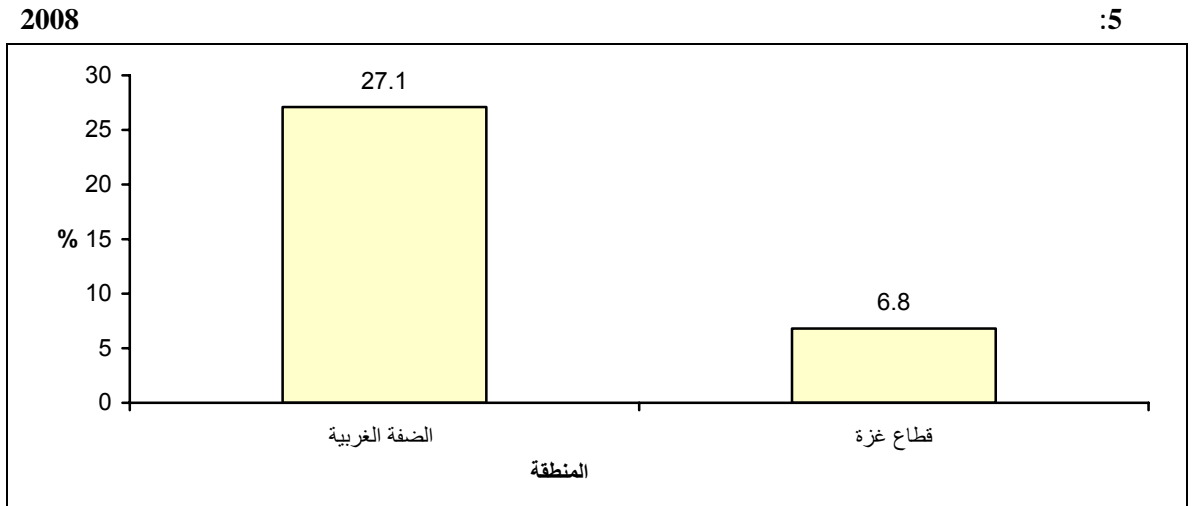
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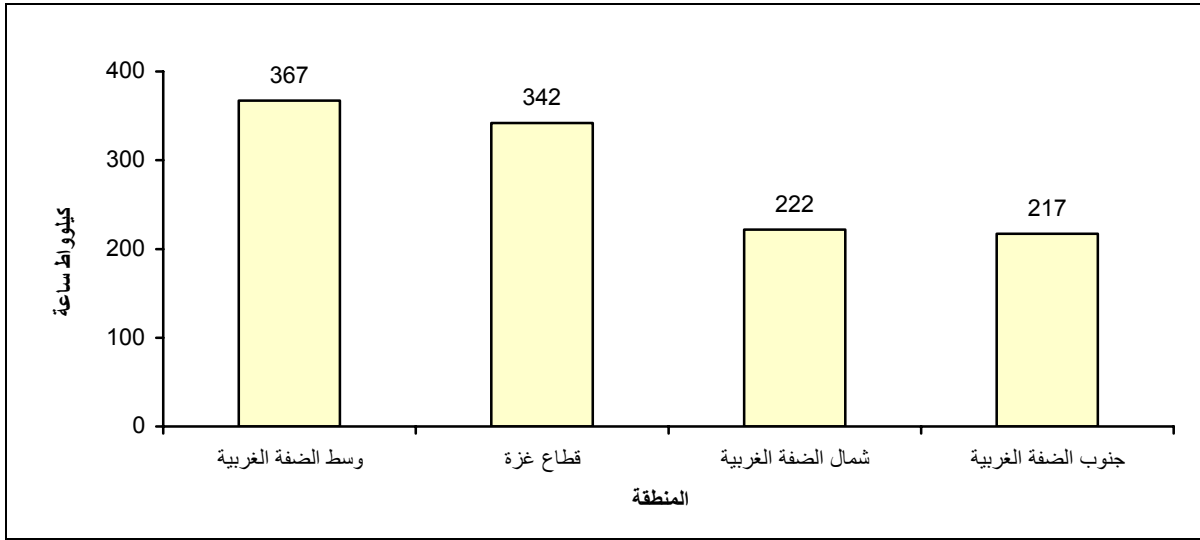
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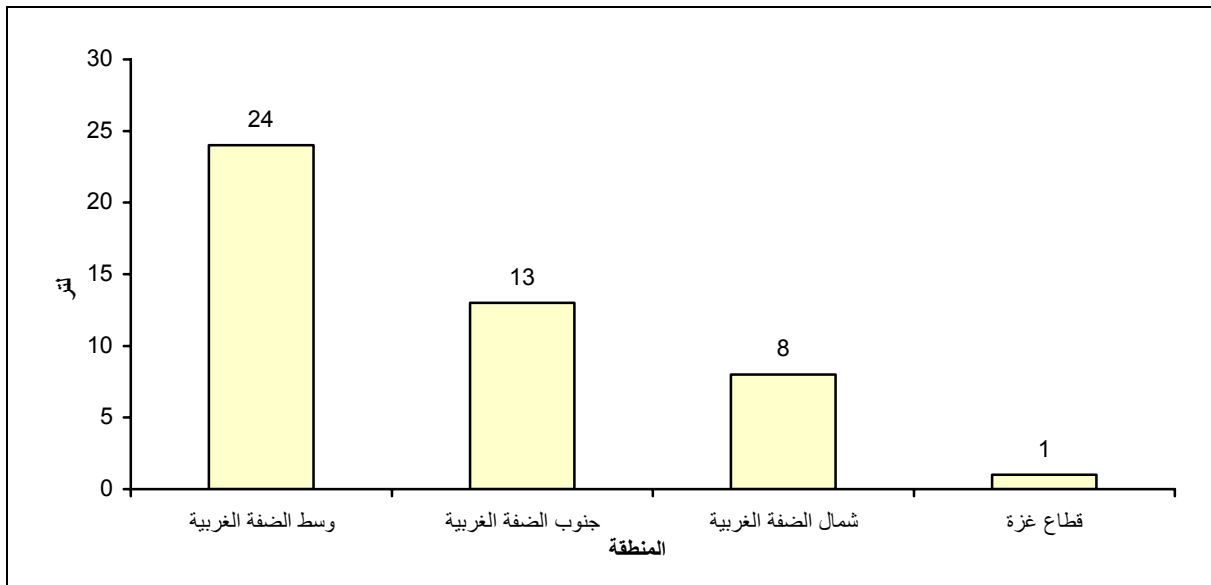
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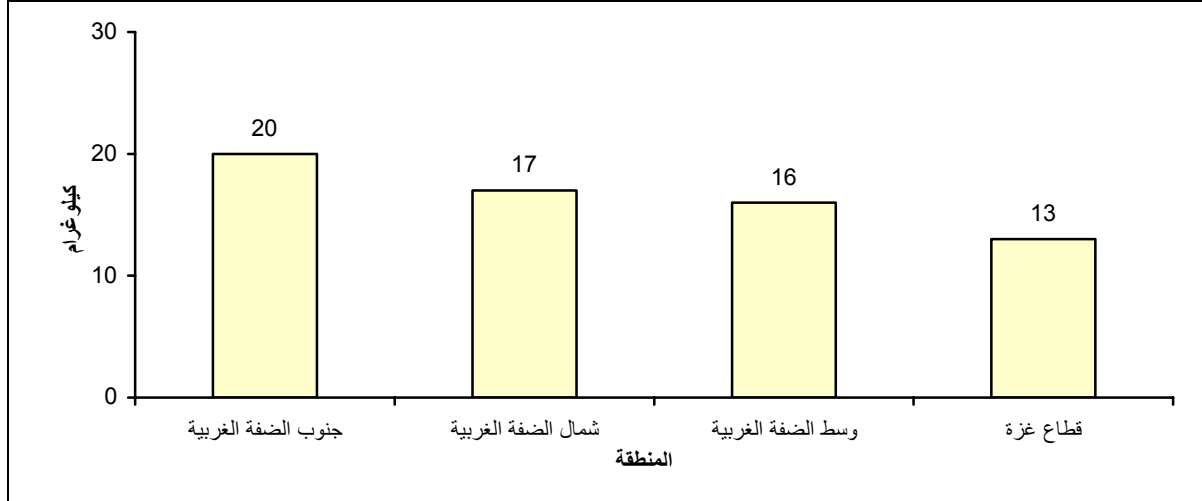
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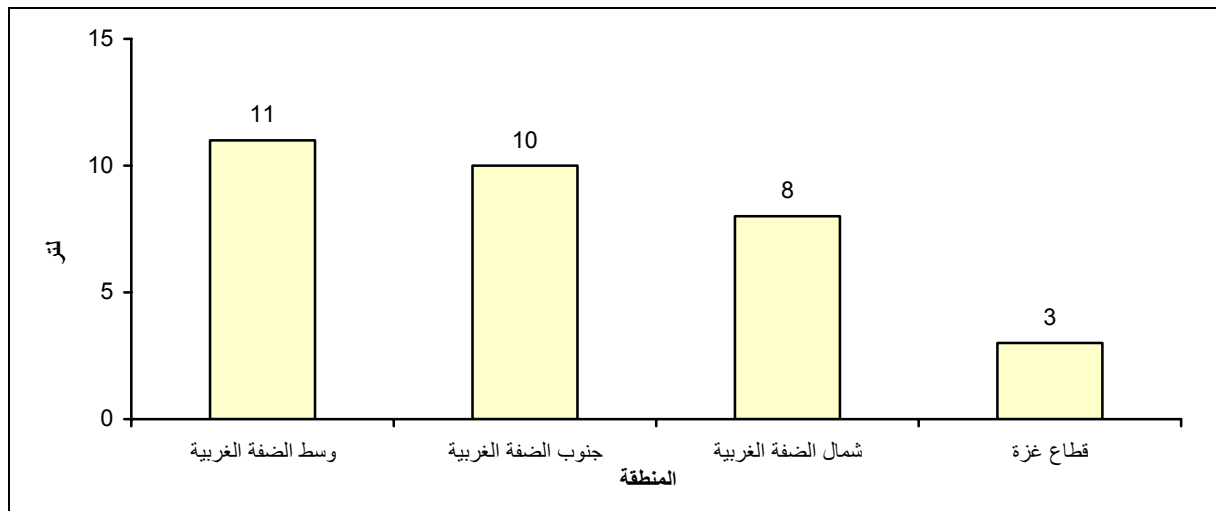
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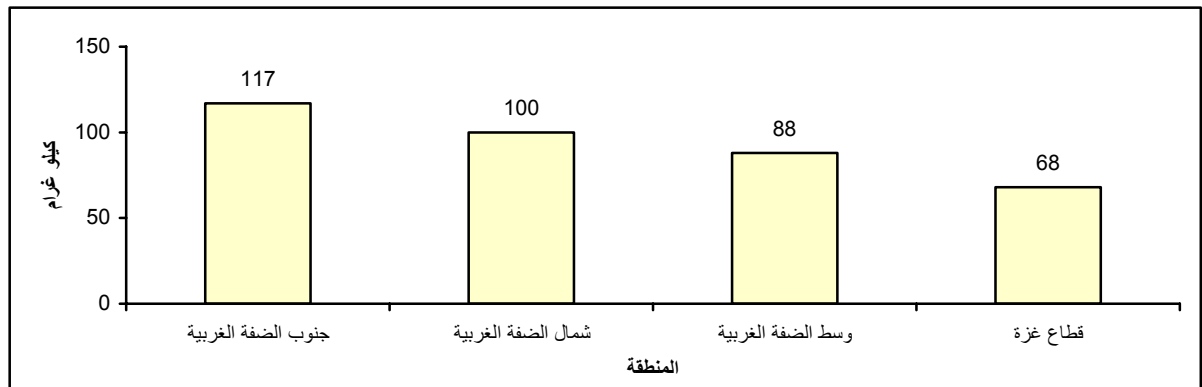
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Tables

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Table 1: Household Energy Indicators in the Palestinian Territory, January and July 2005, April 2006, 2008

Indicator	2008 April 2008	2006 April 2006	2005 July 2005	2005 January 2005	
Percent of Households Connected to the Public Electricity Network	99.7	99.3	99.6	99.4	
Percent of Households Using Solar Heater	69.8	66.9	69.2	67.2	
Percent of Households Using Gas Burner for Cooking	95.9	98.9	99.1	99.3	
Average Household Consumption of Electricity (KWh)	282.0	211.0	264.0	256.0	(.)
Average Household Consumption of LPG (kg)	16.0	18.0	18.0	30.0	()
Average Household Consumption of Kerosene (liter)	5.0	4.0	3.0	22.0	()()

2008

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Table 2: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Electricity Source, April 2008

Region	Main Electricity Source				
	Total	No Electricity	Private Generator	Public Network	
Palestinian Territory	100	0.3	0.0	99.7	
West Bank	100	0.4	0.0	99.6	
North of West Bank	100	0.2	0.0	99.8	
Middle of West Bank	100	0.0	0.0	100.0	
South of West Bank	100	0.9	0.1	99.0	
Gaza Strip	100	0.2	0.0	99.8	

2008

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Table 3: Percentage Distribution of Households by Region and Number of Hours of Electricity Service, April 2008

Region	Number of Hours of Electricity Service			
	Total	24 ساعة 24 Hours	17-23 ساعة 17-23 Hours	اقل من 17 ساعة Less Than 17 Hours
Palestinian Territory	100	64.0	4.8	31.2
West Bank	100	97.1	1.4	1.5
North of West Bank	100	98.8	0.1	1.1
Middle of West Bank	100	94.9	4.4	0.7
South of West Bank	100	97.0	0.0	3.0
Gaza Strip	100	0.0	11.3	88.7

2008

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Table 4: Percentage Distribution of Households in the Palestinian Territory by Region and Using Solar Heater, April 2008

Region	Using Solar Heater		
	Total	Not Using	Using
Palestinian Territory	100	30.2	69.8
West Bank	100	32.1	67.9
North of West Bank	100	29.1	70.9
Middle of West Bank	100	28.4	71.6
South of West Bank	100	40.5	59.5
Gaza Strip	100	26.5	73.5

2008

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Table 5: Percentage Distribution of Households in the Palestinian Territory by Region and Using Conditioning Facility, April 2008

Region	Using Conditioning Facility		
	Total	Not Using	Using
Palestinian Territory	100	78.9	21.1
West Bank	100	72.4	27.6
Gaza Strip	100	91.3	8.7

2008

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Table 6: Percentage Distribution of Households in the Palestinian Territory by Region and Using Heating Facility, April 2008

Region	Using Heating Facility			المنطقة
	Total	Not Using	Using	
Palestinian Territory	100	91.0	9.0	
West Bank	100	90.7	9.3	
Gaza Strip	100	91.8	8.2	

2008

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Table 7: Percentage of Households in the Palestinian Territory by Region and Cooking Facility Used, April 2008

Region	Cooking Facility Used				
	Wood Burner	Kerosene Burner	Gas Burner	Electrical Oven	
Palestinian Territory	11.9	0.5	95.9	10.8	
West Bank	5.1	0.2	99.3	4.1	
North of West Bank	1.8	0.0	99.5	0.7	
Middle of West Bank	0.8	0.0	99.7	5.2	
South of West Bank	14.5	0.6	98.5	7.9	
Gaza Strip	25.2	1.0	89.3	23.9	

2008

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Table 8: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Cooking, April 2008

Region	Main Fuel Used for Cooking				
	Total	Others	Wood	LPG	
Palestinian Territory	100	3.5	4.3	92.2	
West Bank	100	0.6	0.8	98.6	
North of West Bank	100	0.4	0.1	99.5	
Middle of West Bank	100	0.4	0.3	99.3	
South of West Bank	100	1.4	2.2	96.4	
Gaza Strip	100	8.9	11.3	79.8	

2008

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Table 9: Percentage Distribution of Households in the Palestinian Territory by Region and the Secondary Fuel Used for Cooking, April 2008

Region	Secondary Fuel Used for cooking					
	Total	Not Available	Others	Wood	LPG	Electricity
Palestinian Territory	100	78.4	0.8	6.0	3.1	11.7
West Bank	100	90.3	0.6	4.4	0.8	3.9
North of West Bank	100	96.6	0.1	2.2	0.1	1.0
Middle of West Bank	100	93.4	0.0	0.5	0.9	5.2
South of West Bank	100	77.7	2.0	11.8	1.7	6.8
Gaza Strip	100	55.4	0.8	9.1	7.7	27.0

2008

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Table 10: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Baking, April 2008

Region	Main Fuel Used for Baking					
	Total	Not Available	Others	Wood	LPG	Electricity
Palestinian Territory	100	30.7	3.7	23.3	14.9	27.4
West Bank	100	43.1	5.2	17.5	21.4	12.8
North of West Bank	100	50.0	1.7	22.9	17.6	7.8
Middle of West Bank	100	55.3	0.0	12.2	22.9	9.6
South of West Bank	100	20.0	15.7	15.4	25.4	23.5
Gaza Strip	100	6.6	0.6	34.6	2.3	55.9

2008

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Table 11: Percentage Distribution of Households in the Palestinian Territory by Region and the Secondary Fuel Used for Baking, April 2008

Region	Secondary Fuel Used for Baking					
	Total	Not Available	Others	Wood	LPG	Electricity
Palestinian Territory	100	82.9	1.0	4.0	7.9	4.2
West Bank	100	89.9	0.9	2.6	3.1	3.5
Gaza Strip	100	69.4	1.1	6.8	17.2	5.5

2008

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Table 12: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Water Heating, April 2008

Region	Main Fuel Used for Water Heating					
	Total	Not available	Others	LPG	Solar Energy	Electricity
Palestinian Territory	100	4.7	6.1	19.1	48.0	22.1
West Bank	100	1.9	3.7	23.2	48.9	22.3
North of West Bank	100	2.5	1.9	21.3	53.8	20.5
Middle of West Bank	100	2.1	1.0	15.3	49.9	31.7
South of West Bank	100	1.0	9.1	34.5	40.6	14.8
Gaza Strip	100	10.0	10.8	11.1	46.4	21.7

2008

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Table 13: Percentage Distribution of Households in the Palestinian Territory by Region and the Secondary Fuel Used for Water Heating, April 2008

Region	Secondary Fuel Used for Water Heating					
	Total	Not Available	Others	Solar Energy	LPG	Electricity
Palestinian Territory	100	69.7	2.4	5.1	11.0	11.8
West Bank	100	65.1	2.2	7.4	12.7	12.6
North of West Bank	100	77.0	0.8	4.6	5.9	11.7
Middle of West Bank	100	56.9	1.0	2.5	22.6	17.0
South of West Bank	100	56.9	5.1	16.9	12.0	9.1
Gaza Strip	100	78.6	2.7	0.7	7.7	10.3

2008

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Table 14: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Conditioning, April 2008

Region	Main Fuel Used for Conditioning			
	Total	Not Available	Others	Electricity
Palestinian Territory	100	78.9	0.9	20.2
West Bank	100	72.4	0.5	27.1
Gaza Strip	100	91.3	1.9	6.8

2008

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Table 15: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Heating, April 2008

Region	Main Fuel Used for Heating				
	Total	Not Available	Others	LPG	Electricity
Palestinian Territory	100	91.0	1.3	3.4	4.3
West Bank	100	90.7	0.8	5.2	3.3
Gaza Strip	100	91.8	1.7	0.1	6.4

2008

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Table 16: Percentage Distribution of Households in the Palestinian Territory by Region and the Main Fuel Used for Lighting, April 2008

Region	Main Fuel Used for Lighting		
	Total	Others	Electricity
Palestinian Territory	100	0.4	99.6
West Bank	100	0.4	99.6
North of West Bank	100	0.2	99.8
Middle of West Bank	100	0.0	100.0
South of West Bank	100	1.0	99.0
Gaza Strip	100	0.6	99.4

2008

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Table 17 : Percentage of Households that Use Energy in the Palestinian Territory by Region, Type of Locality and Energy Type, April 2008

Region and Type of Locality	Energy Type			
	LPG	Solar Energy	Wood	Electricity
Palestinian Territory	94.8	69.8	30.6	99.7
Urban	93.0	70.5	31.6	99.9
Rural	97.3	68.3	36.2	99.0
Camps	97.0	69.7	15.9	100.0
West Bank	97.2	67.9	23.4	99.6
Urban	96.6	68.9	17.2	100.0
Rural	97.7	68.4	33.9	99.2
Camps	99.1	54.9	7.5	100.0
North of West Bank	98.9	70.9	26.3	99.8
Middle of West Bank	94.5	71.6	13.6	100.0
South of West Bank	97.7	59.5	29.8	99.0
Gaza Strip	90.2	73.5	44.5	99.8

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Table 18: Average Household Consumption of Electricity, Petroleum Products and Wood in the Palestinian Territory by Region and Type of Locality, April 2008

Region and Type of Locality	Average Household Consumption of Electricity, Petroleum Products and Wood					
	() Diesel (Liter)	() Gasoline (Liter)	() Kerosene (Liter)	() LPG (Kg)	() Wood (kg)	(.) Electricity (KWh)
Palestinian Territory	3	10	5	16	87	282
Urban	3	12	4	15	82	293
Rural	4	9	9	18	101	205
Camps	0	2	6	15	63	357
West Bank	4	14	10	17	104	243
Urban	5	18	11	18	101	264
Rural	4	9	9	17	108	206
Camps	0	8	3	17	72	243
North of West Bank	3	8	8	17	100	222
Middle of West Bank	6	24	11	16	88	367
South of West Bank	4	13	10	20	117	217
Gaza Strip	0	1	3	13	68	342

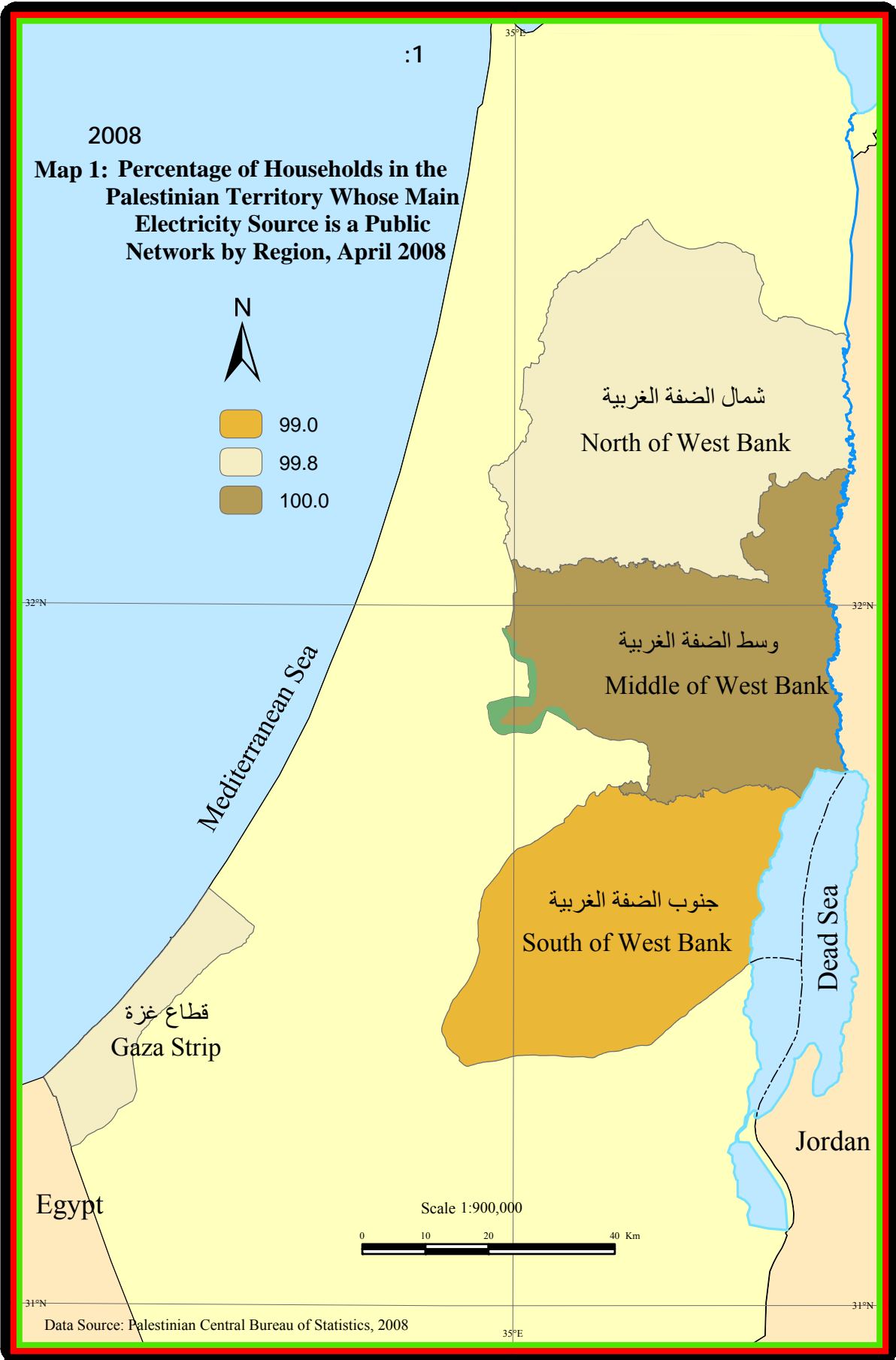
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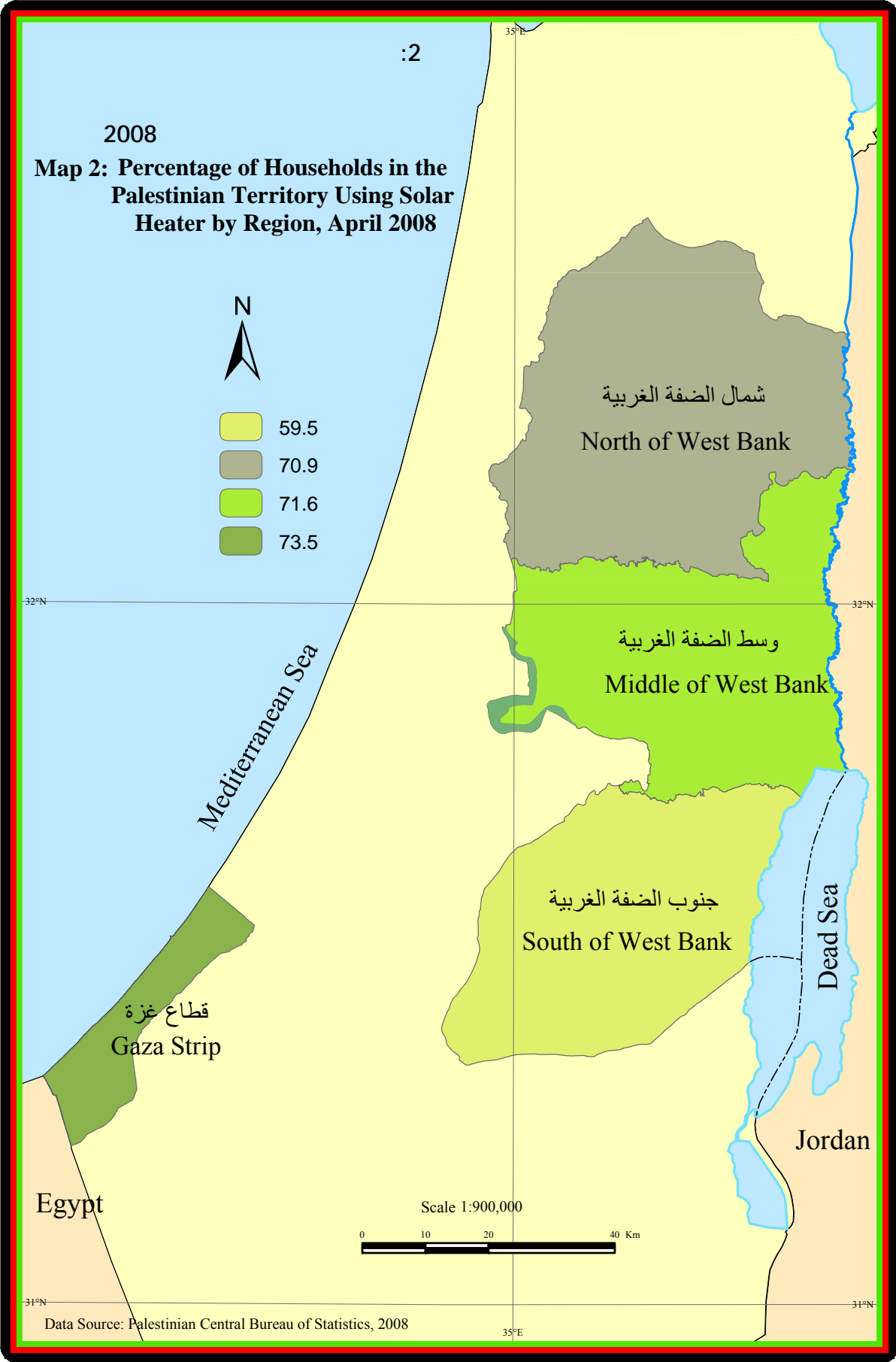
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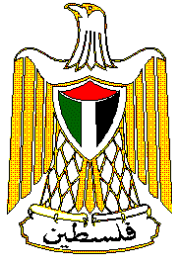
Table 19: Average Consumption Per Capita of Electricity, Petroleum Products and Wood in the Palestinian Territory by Region, April 2008

Region	Average Consumption Per Capita of Electricity, Petroleum Products and Wood			
	() Kerosene (Liter)	() LPG (Kg)	() Wood (kg)	(.) Electricity (KWh)
Palestinian Territory	0.9	2.8	15.0	48.6
West Bank	1.8	3.1	18.9	44.2
North of West Bank	1.5	3.1	18.5	41.1
Middle of West Bank	2.1	3.1	16.9	70.6
South of West Bank	1.7	3.4	19.8	36.8
Gaza Strip	0.5	2.0	10.5	52.6

Maps







**Palestinian National Authority
Palestinian Central Bureau of Statistics**

**Household Energy Survey: Main Results
(April 2008)**

September, 2008

“Cover Price 5 US\$”

PAGE NUMBERS OF ENGLISH TEXT ARE PRINTED IN SQUARE BRACKETS.
TABLES ARE PRINTED IN THE ARABIC ORDER (FROM RIGHT TO LEFT)

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On this occasion, the PCBS extends special thanks to the members of the Core Funding Group (CFG) who contributed in funding this survey for this support.

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Preface

Most countries pay special attention for providing statistics on energy due to the important role of energy in reflecting the situation of the infrastructure, economic situation and the level of living standards of a society. In Palestine, additional special attention is given due to the shortage of natural resources, the high cost of energy and the high population density. All these factors create a need for comprehensive and high quality statistics on this field of study.

In spite of the attention for providing statistical data on household activities which were found to be the highest energy consuming sector, PCBS decided to cover this sector by conducting a special household energy survey that provides high quality data about consumption of energy types, different energy consuming facilities used at household, and the behavior of this important sector.

PCBS conducts energy household survey twice a year. This survey was conducted during the period from 25/05/2008 to 03/07/2008 covering April so as to know the energy consumption behavior in Spring Season.

PCBS hopes that the results of this report will contribute to provide necessary data needed for developing energy situation in households and raising the consumption efficiency. Also, PCBS hopes that this report will contribute to bridge the data gap of energy statistics and to provide useful data for the main data users and decision makers.

September, 2008

**Luay Shabaneh, Ph.D
President**

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Executive Summary

PCBS implemented the Household Energy Survey April 2008. This survey collected data on household energy indicators (electricity, petroleum fuel) in the household activities (cooking, water heating, lighting, and conditioning). Data collection took place during the period 25/05/2008 - 03/07/2008.

The main results of the survey indicate that 99.7% of the Palestinian households were connected to the public electricity network, and 69.8% use solar energy heaters.

21.1% of households in the Palestinian Territory have used conditioning facilities, distributed as 27.6% in the West Bank, and 8.7% in Gaza Strip in April 2008. 9.0% of households in the Palestinian Territory have used heating facilities, distributed as 9.3% in the West Bank, and 8.2% in Gaza Strip in April 2008.

The main results of the survey indicate that 95.9% of the Palestinian households have used gas ovens for cooking, 11.9% of the households used wood burners, 10.8% of the households used electric ovens during April 2008. 92.2% of the Palestinian households depend on liquefied petroleum gas as a main fuel for cooking, 4.3% of the households depend on wood as a main fuel for cooking.

There are 19.1% of the Palestinian households depend on liquefied petroleum gas as a main fuel for water heating, 48.0% of the Palestinian households depend on solar heaters as a main source for water heating, 22.1% of the households depend on electricity as a main source during April 2008.

The main findings of the survey indicate that the average household electricity consumption in the Palestinian Territory during April 2008 was 282 KWh. Also, the main findings indicate that the average per capita electricity consumption in the Palestinian Territory during April 2008 was 48.6 KWh.

The average household gasoline consumption in the Palestinian Territory during April 2008 was 10 liters. While the average household liquefied petroleum gas consumption in the Palestinian Territory during April 2008 was 16 kg.

Chapter One

Introduction

Energy has great importance due to its role in reflecting the country's economy, the people's welfare and their living standards. Also, energy data reflects the infrastructure situation.

In 1996, PCBS established an energy statistics program in order to develop a national plan for energy statistics and to provide data about energy in the Palestinian Territory. Taking into consideration the international recommendations of the United Nations in the field of energy and the special situation of the Palestinian Territory, energy indicators were formulated through a user-producer dialogue workshop held in March 1998. Energy statistics program implemented twelve rounds of household energy survey during 1999-2008.

Because of the importance of the household sector and due to its large contribution to energy consumption in the Palestinian Territory, PCBS decided to conduct a special household energy survey to cover energy indicators in the household sector. To achieve this, a questionnaire was attached to the Labor Force Survey.

This survey aimed to provide data on energy consumption in the household sector and to provide data on energy consumption behavior in the society by type of energy.

This report presents data on various energy households indicators in the Palestinian Territory, and presents statistical data on electricity and other fuel consumption for the household sector, using type of fuel by different activities (cooking, baking, conditioning, lighting, and water heating).

This report consists of five chapters: the first chapter presents the survey objectives and the report structure, the second chapter describes the concepts and definitions and the third chapter briefly describes the main findings, while the fourth chapter presents the methodology used in the survey, consisting the questionnaire design, sampling design, fieldwork operations and data processing, the last chapter includes an assessment of data quality.

Chapter Two

Concepts and Definitions

This section presents the main concepts and definitions used to derive the main indicators of energy consumption from different sources. These concepts and definitions are based on international recommendations in the field of energy statistics, and they are the same in all subjects in Palestinian Central Bureau of Statistics. The main concepts and expressions mentioned in this report were as follows:

Household

One person or a group of persons with or without a household relationship, who live in the same housing unit, share meals and make joint provision of food and other essentials of living.

Fuel

Any matter used for producing energy via thermal, chemical or nuclear interaction.

Gasoline

Gasoline is a hydrocarbon fuel used mainly in internal- combustion engines. This fuel is obtained via filtration of crude oil. The quality of this type of fuel is measured by the octane number (from 0 to 100), which points to its resistance of early burning. This number is obtained by comparing the performance of its resistance of early burning with a mixture of C^7H^{16} and C^8H^{18} . For instance, the performance of "Gasoline 95" equals the performance of a mixture of 95% C^8H^{18} and 5% C^7H^{16} .

Diesel

Diesel is a hydrocarbon fuel mainly used in several types of internal- combustion engines and furnaces. This fuel is obtained via filtration of crude oil.

Liquefied Petroleum Gas (LPG)

It is mainly used in conditioning as well as a fuel in some types of engines and as a raw material for chemical industries. Usually it is marketed in cylinder metallic packages. This gas is comprised of a mixture of gases, e.g. C^3H^8 and C^4H^{10} . It is obtained from natural gas or by fracture of crude petroleum.

Kerosene

Liquid Hydrocarbon fuel obtained by filtration of crude oil, and used as a heating fuel, and as a solvent

Charcoal

The solid residue, consisting mainly of carbon, obtained by the destructive distillation of wood in the absence of air.

Olive Cake

The olive cake (jeft) is the olive solid remainder after the olive pressing. It is considered as a byproduct.

Wood

Refers to all wood used in rough used for fuel purposes.

Household Consumption

Consumption by Households in the different activities within Households (Conditioning, Cooking, Lighting, Water heating and other activities).

Electric Energy

Work done to move an electric charge in a conductor. It is measured in kilowatt-hour.

Electric Energy = Power (KW) X Time (Hours).

Kilo Watt-Hour

Energy unit, a 1 kWh = $1000 \text{ W} \times 3600 \text{ Second} = 3.6 \times 10^6 \text{ Watt-second}$

Other prefixes are used for referring to this unit, e.g. Mega which equals 10^6 , and Giga, which equals 10^9 .

Chapter Three

Main Findings

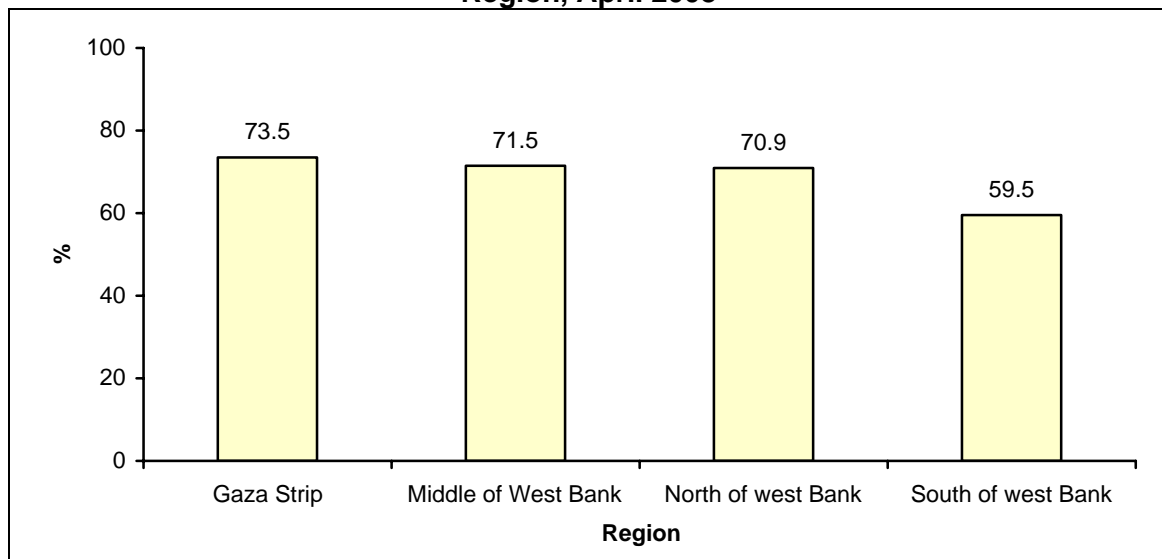
This chapter presents the findings of the household energy survey. These results were divided into four sections. The first section introduces the results related to energy sources in the domestic sector during April 2008, while the second section introduces the results related to the facilities used in conditioning and cooking. The third section presents the use purposes of energy types in the different activities in the households. The fourth presents the household and per capita consumption of the different energy types.

3.1 Energy Sources

The results of the survey indicate that 99.7% of households in the Palestinian Territory were connected to the public electricity network in April 2008, where this percentage was 99.3% in April 2006, While 0.3% have no electricity services. From the results, it is noted that South of the West Bank has the lowest percentage of households connected to electricity network (99.0%).

The data of the survey show that 69.8% of households in the Palestinian Territory are utilizing solar energy by using solar energy heaters in April 2008, where this percentage was 66.9% in April 2006. It is noted that this percentage differs within the Palestinian regions in April 2008, it was about 73.5% in Gaza Strip and 67.9% in the West Bank.

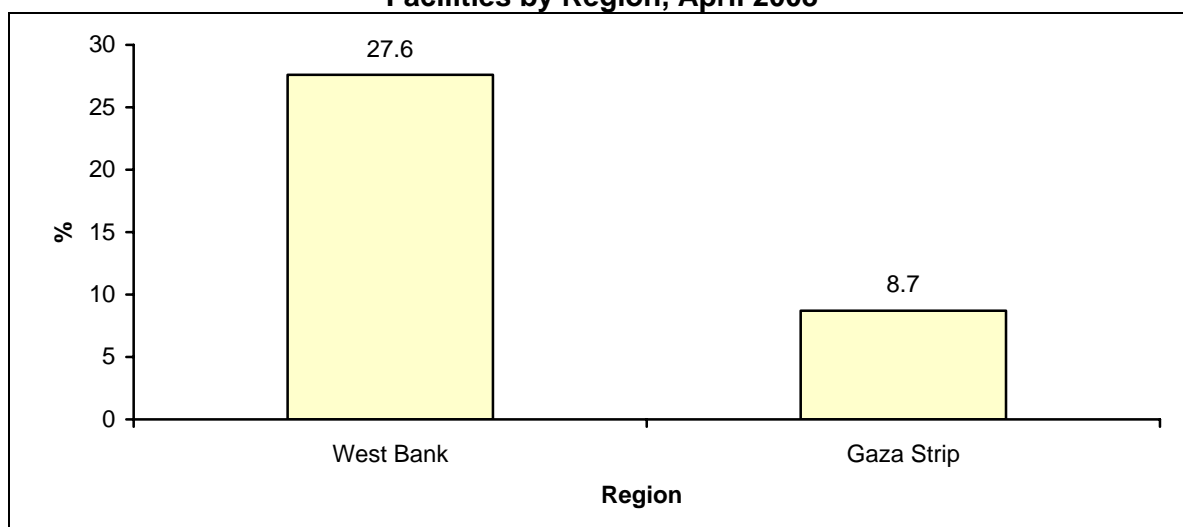
Figure 1: Percentage of Households in the Palestinian Territory Using Solar Heater by Region, April 2008



3.2 Energy Consumption Facilities

21.1% of households in the Palestinian Territory have used conditioning facilities in April 2008, distributed as 27.6% in the West Bank, and 8.7% in Gaza Strip.

Figure 2: Percentage of Households in the Palestinian Territory Using Conditioning Facilities by Region, April 2008



Also, The results of the survey indicate that 9.0% of households in the Palestinian Territory have used heating facilities, distributed as 9.3% in the West Bank, and 8.2% in Gaza Strip in April 2008.

The findings of the survey indicate that 95.9% of households in the Palestinian Territory have used gas ovens for the purpose of preparing food (cooking) in April 2008. And 11.9% of the households used wood burner, and 10.8% of the households used electrical ovens.

Figure 3: Percentage of Households in the Palestinian Territory Using Cooking Facilities by Cooking Facility, April 2008



3.3 Energy Uses

The data show that 92.2% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for preparing food (cooking) in April 2008. 4.3% of the households depend on wood as a main fuel for preparing food (cooking).

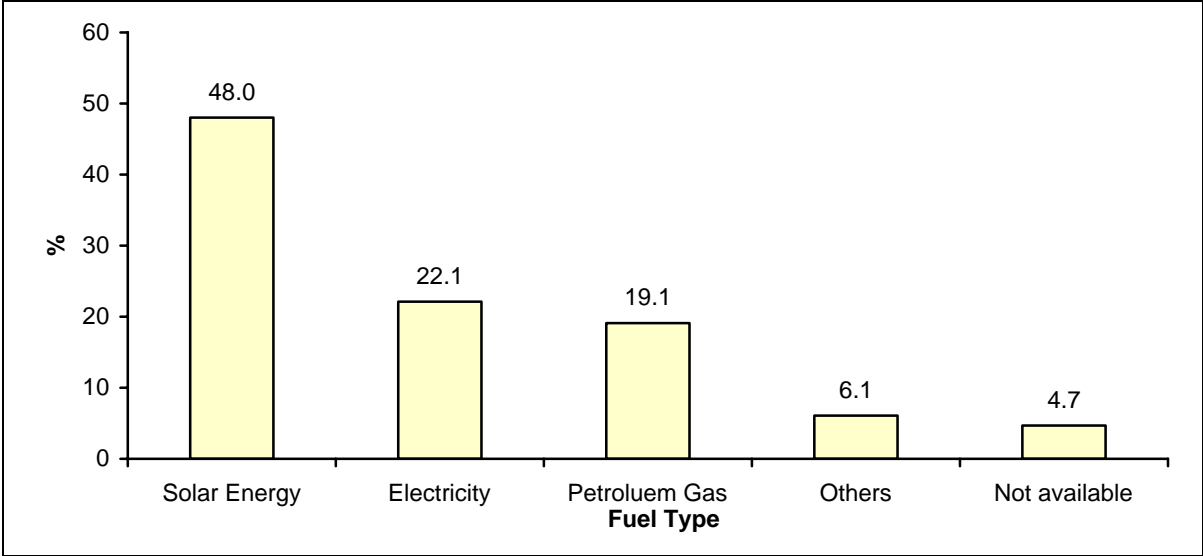
Also, 78.4% of households in the Palestinian Territory have no secondary fuel for preparing food (cooking) in April 2008. While 11.7% of the households depend on electricity as a secondary source, 3.1% of the households depend on liquefied petroleum gas as a secondary fuel for preparing food (cooking).

And 14.9% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for baking in April 2008. 27.4% of households in the Palestinian Territory depend on electricity as a main fuel for baking, 23.3% of the households depend on wood as a main fuel for baking.

Also, the data show that 82.9% of households in the Palestinian Territory have no secondary fuel for baking in April 2008. While 4.2% of the households depend on electricity as a secondary source, 7.9% of the households depend on liquefied petroleum gas as a secondary fuel.

The results of the survey indicate that 19.1% of households in the Palestinian Territory depend on liquefied petroleum gas as a main fuel for water heating in April 2008, the data of the survey results indicate that 48.0% of households in the West Bank depend on solar heaters as a main source for water heating. While 22.1% of the households depend on electricity as a main source.

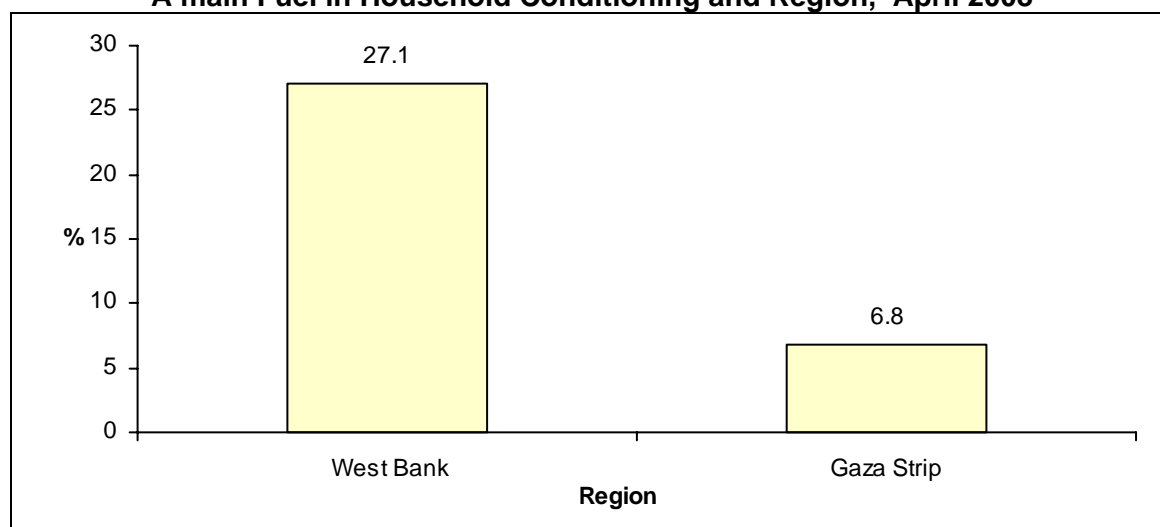
Figure 4: Percentage Distribution of Households in the Palestinian Territory by Main Fuel Used in Water Heating, April 2008



Also, 69.7% of households in the Palestinian Territory have no secondary fuel for water heating in April 2008. And 11.0% of the households depend on liquefied petroleum gas as a secondary source, 5.1% of the households depend on solar heaters as a secondary fuel, 11.8% of households depend on electricity as a secondary fuel.

The findings of the survey indicate that 21.1% of households in the Palestinian Territory condition their houses in April 2008, And 20.2% of households depend on electricity as a main fuel for household conditioning.

Figure 5: Percentage of Households in the Palestinian Territory by Using Electricity as A main Fuel in Household Conditioning and Region, April 2008



Also, the results indicate that 9.0% of households in the Palestinian Territory heat their houses during April 2008. The results showed that 4.3% of the households depend on electricity as main source for heating, and 3.4% of the households depend on Liquefied Petroleum Gas during April 2008.

99.6% of households in the Palestinian Territory depend on electricity as a main source for lighting in April 2008, While it reached 99.6% of the households in the West Bank, it did not exceed 99.4% in Gaza Strip.

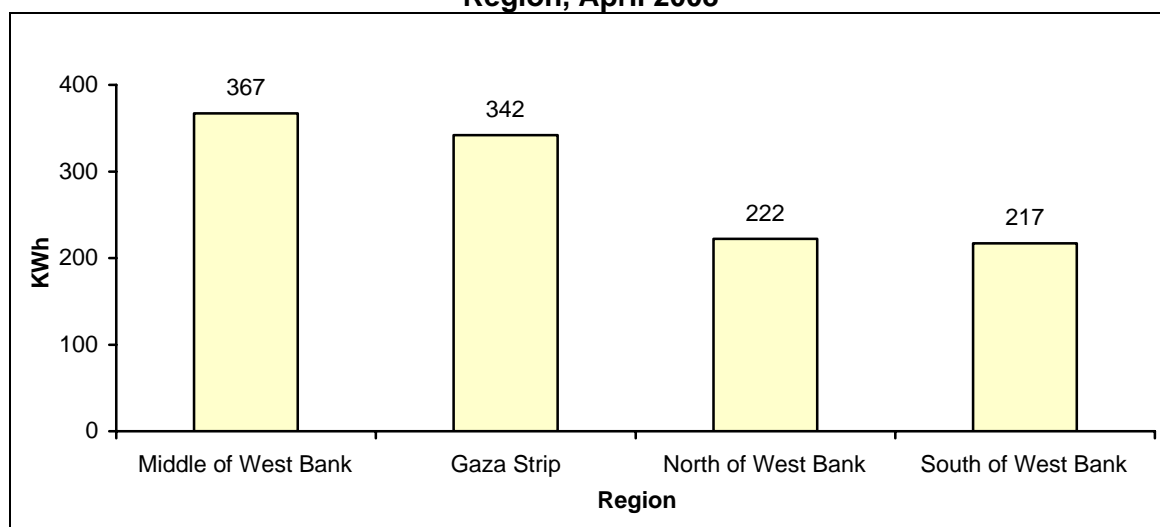
3.4 Household Energy Consumption

This section presents the results related to household, per capita and total consumption of the different types of energy used in Palestinian Territory during April 2008.

Electricity Consumption

The findings of the survey indicate that the average household electricity consumption in the Palestinian Territory during April 2008 was 282 KWh, where this average was 211 KWh during April 2006. This average ranges by region and type of locality in April 2008, it reached 367 KWh in the Middle of the West Bank and didn't exceed 217 KWh in the South of West Bank. This average was about 293 KWh in urban localities and 205 KWh in rural localities, and 357 KWh in refugee camps.

Figure 6: Average Household Electricity Consumption in the Palestinian Territory by Region, April 2008

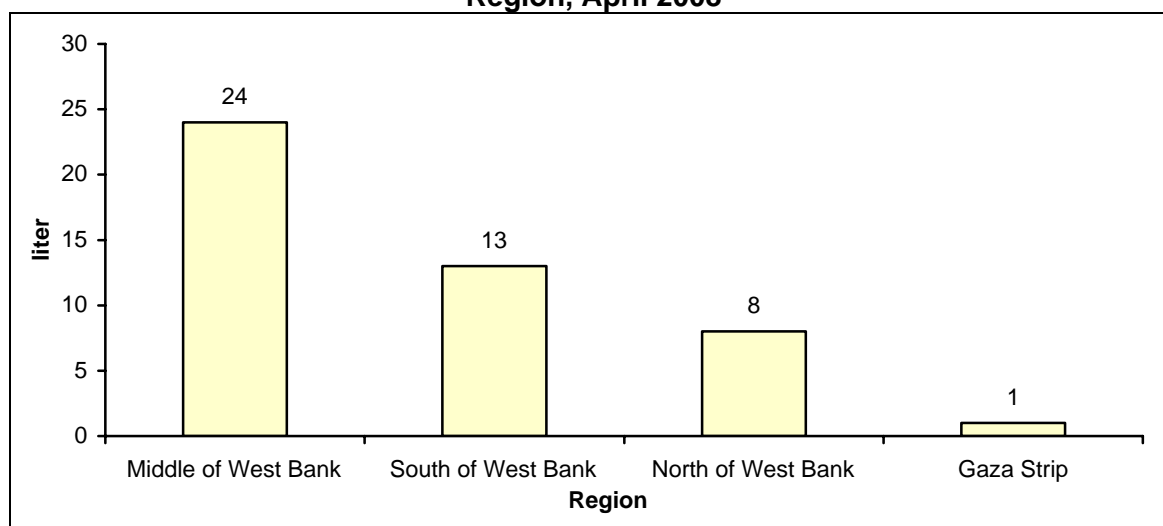


The results indicate that the average per capita electricity consumption in the Palestinian Territory during April 2008 was 48.6 KWh. It reached 70.6 KWh in the Middle of the West Bank and 36.8 KWh in the South of the West Bank.

Gasoline Consumption

The data of the survey show that the average household gasoline consumption in the Palestinian Territory during April 2008 was 10 liters. This average was about 12 liters in urban localities, 9 liters in rural localities and 2 liters in refugee camps. This average ranged by region and type of locality, it reached 24 liters in the Middle of the West Bank and didn't exceed 8 liters in the North of the West Bank, and one liter in Gaza Strip.

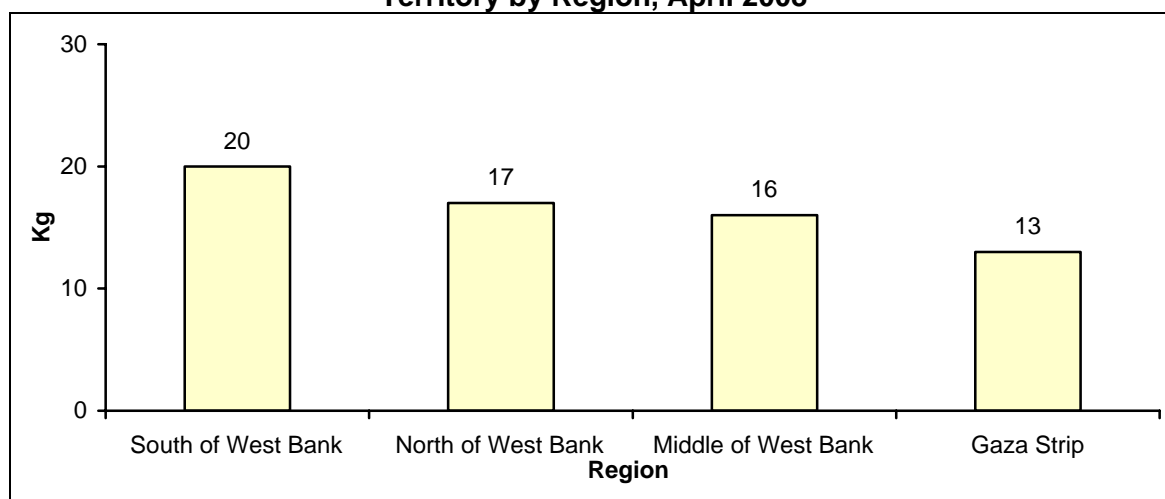
Figure 7: Average Household Gasoline Consumption in the Palestinian Territory by Region, April 2008



Liquefied Petroleum Gas Consumption

The findings of the survey indicate that the average household liquefied petroleum gas consumption in the Palestinian Territory during April 2008 was 16 kg, which was the 18 kg in April 2006. This average ranges by region and type of locality in April 2008. It reached 20 kg in the South of the West Bank, and didn't exceed 13 kg in Gaza Strip.

Figure 8: Average Household Liquefied Petroleum Gas Consumption in the Palestinian Territory by Region, April 2008

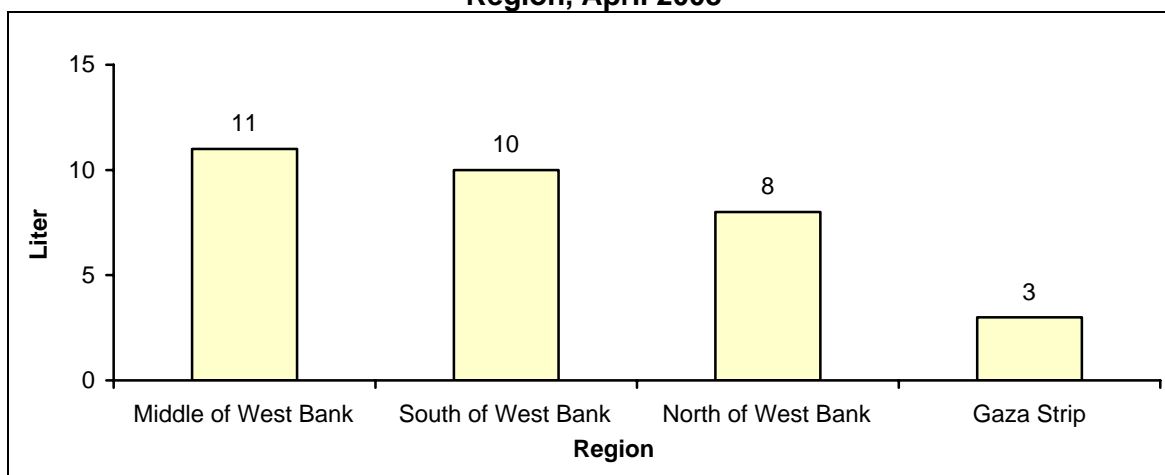


While the average per capita liquefied petroleum gas consumption in the Palestinian Territory was 2.8 kg, and reached 3.4 kg in the South of the West Bank.

Kerosene Consumption

The results of the survey indicate that the average household kerosene consumption in the Palestinian Territory during April 2008 was 5 liters, compared with 4 liters in April 2006. This average ranges by region and type of locality, it reached 11 liters in the Middle of the West Bank. This average was about 4 liters in urban localities, 9 liters in rural localities, and 6 liters in refugee camps.

Figure 9: Average Household Kerosene Consumption in the Palestinian Territory by Region, April 2008

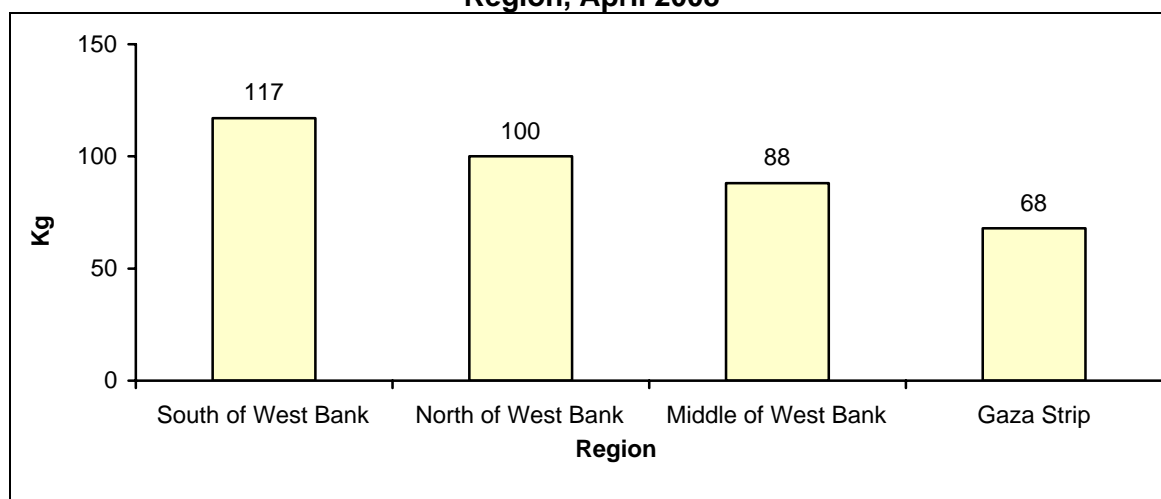


And the average per capita kerosene consumption in the Palestinian Territory in April 2008 was 0.9 liter. This average was about 2.1 liter in the Middle of the West Bank in April 2008.

Wood Consumption

The data of the survey show that the average household wood consumption in the Palestinian Territory during April 2008 was 87.0 kg. This average ranges by region and type of locality, it reached 117 kg in the South of the West Bank, and 68 kg in Gaza Strip. This average was about 82 kg in urban localities, 101 kg in rural localities, and 63 kg in refugee camps.

Figure 10: Average Household Wood Consumption in the Palestinian Territory by Region, April 2008



While the average per capita wood consumption in the Palestinian Territory in April 2008 was 15.0 kg. This average was about 19.8 kg in the Middle of the West Bank and 10.5 kg in the Gaza Strip.

Chapter Four

Methodology

This section presents a documentation of the methodology used in preparing this report.

4.1 Questionnaire

The household energy survey questionnaire was designed in accordance with similar country experience and with international standards and recommendations for the most important indicators, taking into account the special situation of the Palestinian Territory.

4.2 Sample and Frame

Target Population

All Palestinian households living within the Palestinian Territory.

Sampling Frame

Sampling frame is a master sample from the Population, Housing and Establishment Census 1997. It consists of a list of enumeration areas, which were used as PSU's in the first stage of selection.

Sampling Design

The sample is a two-stage stratified cluster random sample, which is a sub-sample of Labour Force Survey (LFS) sample, that is conducted every 13 weeks. The total sample of Household Energy Survey is about 3,094 households occupies six weeks of the second quarter 2008 of LFS.

Stratification

In designing the sample of LFS, three levels of stratification were made:

1. Stratification by governorate.
2. Stratification by place of residence which comprises:
(a) Urban (b) Rural (c) Refugee camps
3. Stratification by locality size.

Sample Unit

In the first stage, the sampling units are the enumerator areas (clusters) in the master sample. In the second stage, the sampling units are households.

Analysis Unit

Analysis units are composed of households.

Sample Size

The sample size is of (3,094) Palestinian households in the West Bank and Gaza Strip, where this sample has been distributed according to the locality in urban areas, in rural areas and in refugee camps.

4.3 Fieldwork

Training Fieldworkers

Fieldworkers were trained on the main skills before the start of data collection. The interviewers were trained on the Household Energy Survey by implementing the training course in the West Bank trainees. Instructions for filling the questionnaire were made available for the interviewers. The training provides the participant with aims and definitions of the different indicators and expressions of the survey and how to fill in the questionnaire.

Data Collection

Fieldwork started on 25/05/2008 and lasted until 03/07/2008. Fieldwork teams were distributed to all districts proportional to the sample size of each governorate. The fieldwork team consisted of 24 members including one fieldwork coordinator, 4 supervisors, 4 editors and 15 interviewers.

During fieldwork 2,649 Households were visited in the Palestinian Territory, the end results for the interview become as following:

(2,251)	Complete questioner
(31)	Traveling households
(24)	Housing unit not existed
(109)	Cases no body in the house
(43)	Objection cases
(137)	Housing unit abandoned
(21)	Household can't give data
(33)	Other cases

4.4 Data Processing

The data processing stage consisted of the following operations:

1. Editing and coding before data entry: All questionnaires were edited and coded in the office using the same instructions adopted for editing in the field.
2. Data entry: At this stage, data was entered into the computer using a data entered template written in CSpro. Data entry was done decentralized in Nablus, Hebron, in addition to the central office in Al-Bireh. The data entry program was prepared to satisfy a number of requirements such as:
 - Duplication of the questionnaires on the computer screen.
 - Logical and consistency check of data entered.
 - Possibility for internal editing of question answers.
 - Maintaining a minimum of digital data entry and fieldwork errors.
 - User friendly handling.
 - Possibility of transferring data into another format to be used and analyzed using other statistical analytic systems such as SPSS.

4.5 Weight Calculation and the Estimation

Because the sampling weight counteractive with the percentage sample from the frame, and as this ratio different from the percentage sample for the society in reference period, therefore the weight was adjusted to show number of population in the middle of 2008. And the weight was adjusted to make the distribution of people in the sample by region, sort, and structure age become identical to this distribution on census 2007. Finally, weight were adjusted to compensate for incomplete cases that occur during data collecting.

Data Quality

The concept of data quality constructs of many aspects starting from the planning to the survey up to publishing method and understand the data. The main principles of the statistical quality are Accuracy, Comparability, and Data Quality Assurance Procedures.

5.1 Accuracy

It includes many aspects of the survey mainly the statistical errors due to the sample, and also not statistical errors refers to the workers and survey tools, and includes also the response rates in this survey and their effect on the assumptions. This section includes:

1. Sampling Errors

These types of errors evolved as a result of studying a part of the society and not all of it, and because this survey is a sample based the data of this survey will be affected by sampling errors due to using a sample and not the whole frame of the society, and so differences appear compared with the actual values that could be obtained through census. For this survey, variance calculations were made for average household consumption and total consumption for the different types of energy in the Palestinian Territory.

The results of wood, charcoal and olive cake suffers from a high variance, a tension should be taken when dealing with the average household consumption of these types of fuel, keeping I mind that there is no problem in publishing the data among the geographical level (North of the West Bank, Middle of the West Bank, South of the West Bank and Gaza Strip), publishing data among the governorate level is not possible due to the high variance especially to the wood, Charcoal and olive cake. the variance for the main indicators of this survey are as follows

Variable	Estimate		Standard Error	C.V %	Confidence %95	
	Unit	Value			Lower	Upper
Main Electricity Source	%	99.7	0.1	0.001	99.3	99.9
Use of Solar Heaters	%	69.8	1.6	0.023	66.5	72.9
Average Electricity Consumption	KWh	282	7.5	0.027	267	297
Average wood Consumption	Kg	91	7.68	0.085	75.6	106
Average Gasoline Consumption	Liter	10	0.93	0.096	7.8	11.5

2. Non Sampling Errors

These errors are due to non-response cases as well as the implementation of surveys. In this survey, these errors emerged because of (a) the special situation of the questionnaire itself which depends on type of estimation (b) diversity of sources (e.g. the interviewers, respondent, editors, coders, data entry operator ...etc).

The sources of these errors can be summarized in:

1. Some of the households were not in their houses and the interviewers couldn't meet them.
2. Some of the households didn't show attention toward the questionnaire.
3. Some errors occurred due to the way the questions were asked by interviewers.
4. Misunderstood of the questions by the respondents.
5. Answering the questions related to consumption by making estimations.

It is important to mention that a 5% from the sample of this survey was re-interviewed, the results of this re-interview were reported by the supervisors, the re-interview shows the variance in estimation By interviewers for wood, charcoal and olive cake consumed when the interviewer is different between the one who answers for the main survey questionnaire and the one who answers the re-interview questionnaire.

$$\begin{aligned} \text{None response rate} &= \frac{\text{Sum of none response cases}}{\text{Net sample}} \times 100\% \\ &= \frac{398}{2,649} \times 100\% = 15\% \end{aligned}$$

$$\begin{aligned} \text{Response rate} &= 100\% - \text{none response rate} \\ &= 100\% - 15\% = 85\% \end{aligned}$$

The none response cases were treated using adjustment groups (strata) and the following equation shows this

$$fg = \frac{\sum_{ng} wi - \sum_{o.c} wi}{\sum_{rg} wi}$$

Where

$$\begin{aligned} \sum_{ng} wi &\text{ Total weights in g group} \\ \sum_{o.cg} wi &\text{ Total weights over coverage} \\ \sum_{rg} wi &\text{ Total weights responding in the survey} \end{aligned}$$

Each unit is given fg value for the interval lies in and finally we get $w'i$ using the following equation

$$w'gi = wi * fgi$$

5.2 Comparability

The data of the household energy survey is comparable geographically and among time, the results when comparing the data between different geographical areas and when comparing the data of this survey with the data of previous surveys and census 2007.

5.3 Data Quality Assurance Procedures

Several measures have been made to ensure quality control in the survey, such as the training of the fieldworkers on the main skills before the start of data collection, and conducting field visits to field researchers to ensure the integrity of data collection, in addition to conducting a re-interview for 5% of households, and then Audit questionnaire have been carried over before data entry, and then using a program that does not allow any mistakes during the process of data entry, and then examine the data were made to ensure that they are free from errors not been discovered earlier, after the receipt of the raw data file, cleaning and inspection of the anomalous values have been made, and also inspection of the harmony between the different questions on the questionnaire.

5.4 Special Technical Notes

This part presents the important technical notes on the indicators presented in The results of the survey:

- In all calculations related to Gasoline, we dealt with the average of all available types of Gasoline.
- In this survey we collect data about consumption of olive cake and coal in household, but because of less of data and since the variance of this data is fairly high we publish this data through others entry in the tables.
- We calculate the average consumption per capita of electricity and energy types in West Bank regions (North, Middle, and South of the West Bank) by using the average of household member in the West Bank.
- According to the average household consumption of electricity, petroleum products and coal, it represents the households that use these energy types.
- The increase in consumption of electricity and the decrease in the consumption of the other types of fuel in Gaza Strip returns to the Israeli siege imposed there.

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