

# Groundwater in Lebanon



Prepared by:  
Eng. Nisrine Ghattas

# **I. Groundwater Policy in Lebanon:**

The use of the groundwater in Lebanon was legislated by a series of issued laws and decrees since 1926, as per the following order:

1. The decree No. 320 issued in 1926 (by the French Mandate)
2. The decree No. 14438 issued in 2/5/1970
3. The Water Code No. 221 issued in 29/5/2000
4. The Decision No. 118 issued in 13/9/2010
5. The Water Code No. 77 issued in 13/4/2018
6. The Water Code No. 192 issued in 16/10/2020

# **I. Groundwater Policy in Lebanon:**

In general, the authorization procedure of water wells in Lebanon consists of 2 permits that shall be obtained from the Ministry of Energy & Water:

1. The excavation Permit
2. The investment (use) permit

despite the existence of wide range of legislations and procedures, Lebanon is still suffering from the random and hazardous withdrawal of groundwater; the aquifers are excessively exploited due to the huge number of illegal wells. Thus, in order to reduce the impact of this misuse, a national groundwater model shall be produced based on the actual conditions to outline the future groundwater investment in a sustainable way.

# **I. Groundwater Policy in Lebanon:**

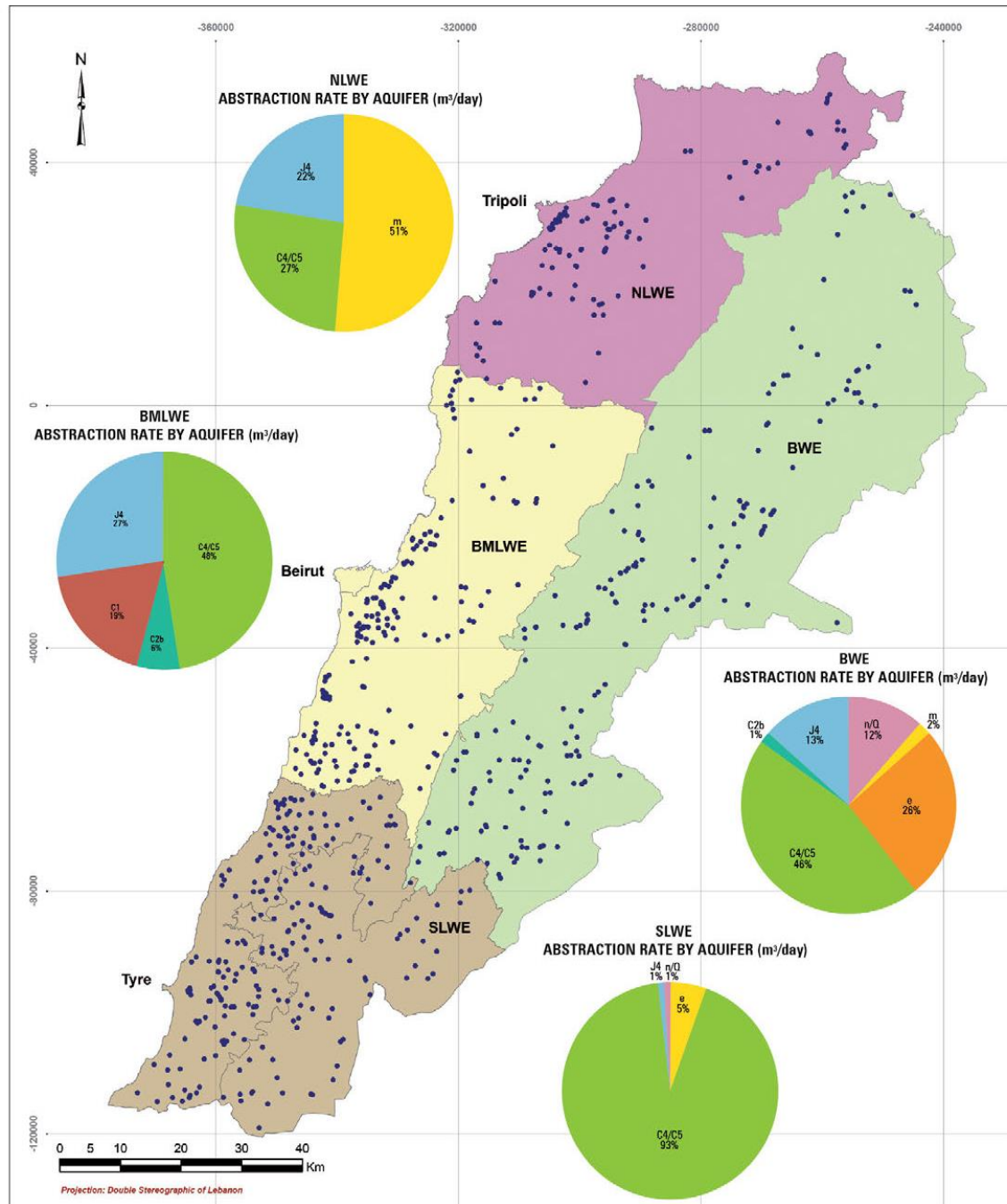
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## II. Public Wells Abstraction

Ref: Groundwater Assessment study done in 2014

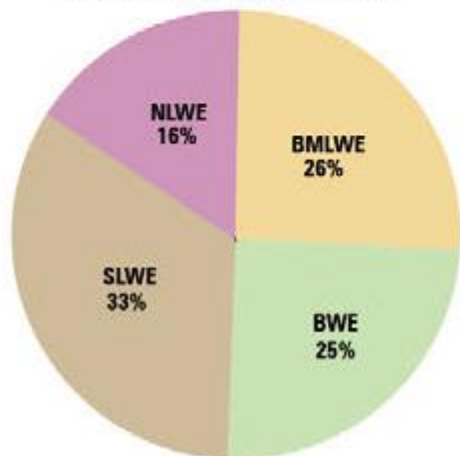


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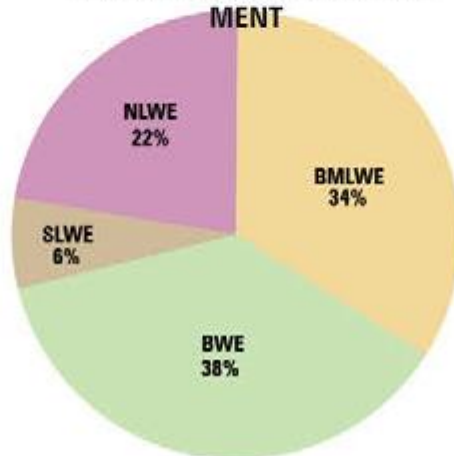
**DISTRIBUTION OF WELLS, PIEZOMETERS AND TOTAL DISCHARGE RATES BY ESTABLISHMENT**

ESTABLISHMENT	TOTAL NO. OF WELLS SURVEYED IN THE FIELD	TOTAL EXTRACTION (rate m <sup>3</sup> /day)	TOTAL EXTRACTION RATE (million m <sup>3</sup> /year)	TOTAL NUMBER OF PIEZOMETERS
BMLWE	218	193,642	71	38
BWE	209	90,422	33	42
SLWE	277	309,128	113	7
NLWE	137	88,383	32	25
Total	841	681,576	249	112

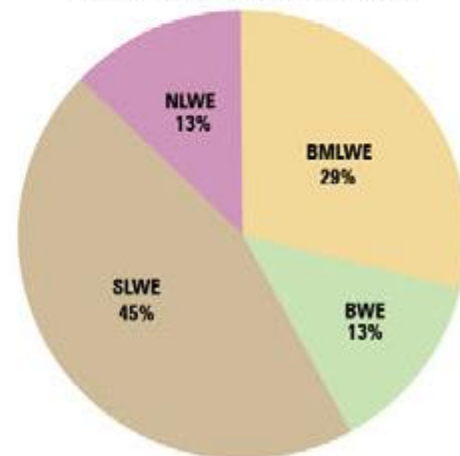
**PERCENTAGE DISTRIBUTION OF WELLS BY ESTABLISHMENT**



**PERCENTAGE DISTRIBUTION OF PIEZOMETERS BY ESTABLISHMENT**

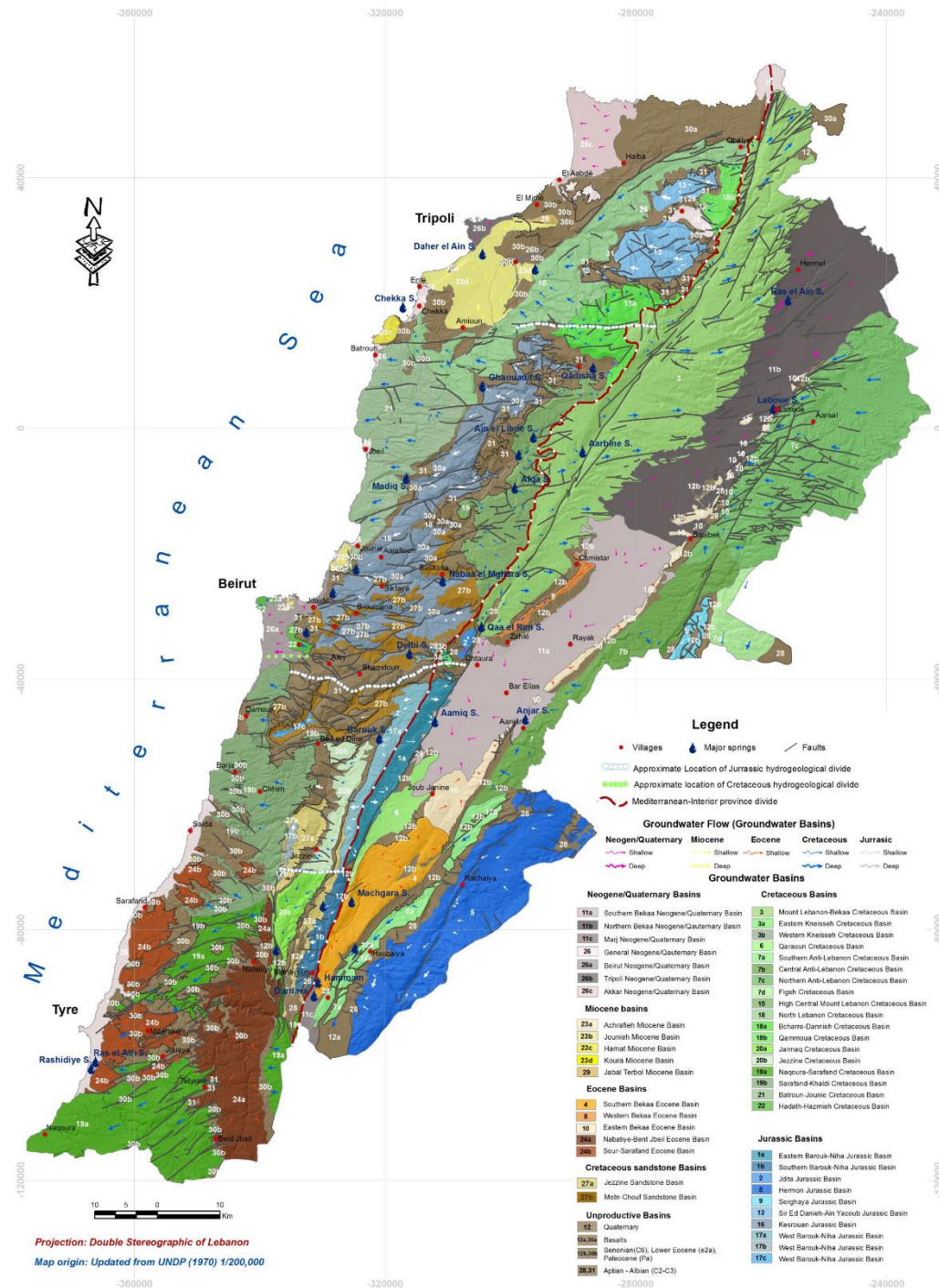


**PERCENTAGE OF TOTAL ABSTRACTION RATES BY ESTABLISHMENT**



# III. Groundwater Basins

Updated from UNDP 1970



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## Groundwater Basins

### Neogene/Quaternary Basins

- 11a Southern Bekaa Neogene/Quaternary Basin
- 11b Northern Bekaa Neogene/Quaternary Basin
- 11c Marj Neogene/Quaternary Basin
- 26 General Neogene/Quaternary Basin
- 26a Beirut Neogene/Quaternary Basin
- 26b Tripoli Neogene/Quaternary Basin
- 26c Akkar Neogene/Quaternary Basin

### Miocene basins

- 23a Achrafieh Miocene Basin
- 23b Jounieh Miocene Basin
- 23c Hamat Miocene Basin
- 23d Koura Miocene Basin
- 29 Jabal Terbol Miocene Basin

### Eocene Basins

- 4 Southern Bekaa Eocene Basin
- 8 Western Bekaa Eocene Basin
- 10 Eastern Bekaa Eocene Basin
- 24a Nabatiye-Bent Jbeil Eocene Basin
- 24b Sour-Sarafand Eocene Basin

### Cretaceous sandstone Basins

- 27a Jezzine Sandstone Basin
- 27b Metn-Chouf Sandstone Basin

### Unproductive Basins

- 12 Quaternary
- 12a,30a Basalts
- 12b,30b Senonian(C6), Lower Eocene (e2a), Paleocene (Pa)
- 28,31 Aptian - Albian (C2-C3)

### Cretaceous Basins

- 3 Mount Lebanon-Bekaa Cretaceous Basin
- 3a Eastern Kneisseh Cretaceous Basin
- 3b Western Kneisseh Cretaceous Basin
- 6 Qaraoun Cretaceous Basin
- 7a Southern Anti-Lebanon Cretaceous Basin
- 7b Central Anti-Lebanon Cretaceous Basin
- 7c Northern Anti-Lebanon Cretaceous Basin
- 7d Figeih Cretaceous Basin
- 15 High Central Mount Lebanon Cretaceous Basin
- 18 North Lebanon Cretaceous Basin
- 18a Bcharre-Dannieh Cretaceous Basin
- 18b Qammoua Cretaceous Basin
- 20a Jarmaq Cretaceous Basin
- 20b Jezzine Cretaceous Basin
- 19a Naqoura-Sarafand Cretaceous Basin
- 19b Sarafand-Khaldi Cretaceous Basin
- 21 Batroun-Jounieh Cretaceous Basin
- 22 Hadath-Hazmieh Cretaceous Basin

### Jurassic Basins

- 1a Eastern Barouk-Niha Jurassic Basin
- 1b Southern Barouk-Niha Jurassic Basin
- 2 Jdita Jurassic Basin
- 5 Hermon Jurassic Basin
- 9 Serghaya Jurassic Basin
- 13 Sir Ed Danieh-Ain Yacoub Jurassic Basin
- 16 Kesrouan Jurassic Basin
- 17a West Barouk-Niha Jurassic Basin
- 17b West Barouk-Niha Jurassic Basin
- 17c West Barouk-Niha Jurassic Basin

-280000

-240000



# IV. Average Yearly Water Budget

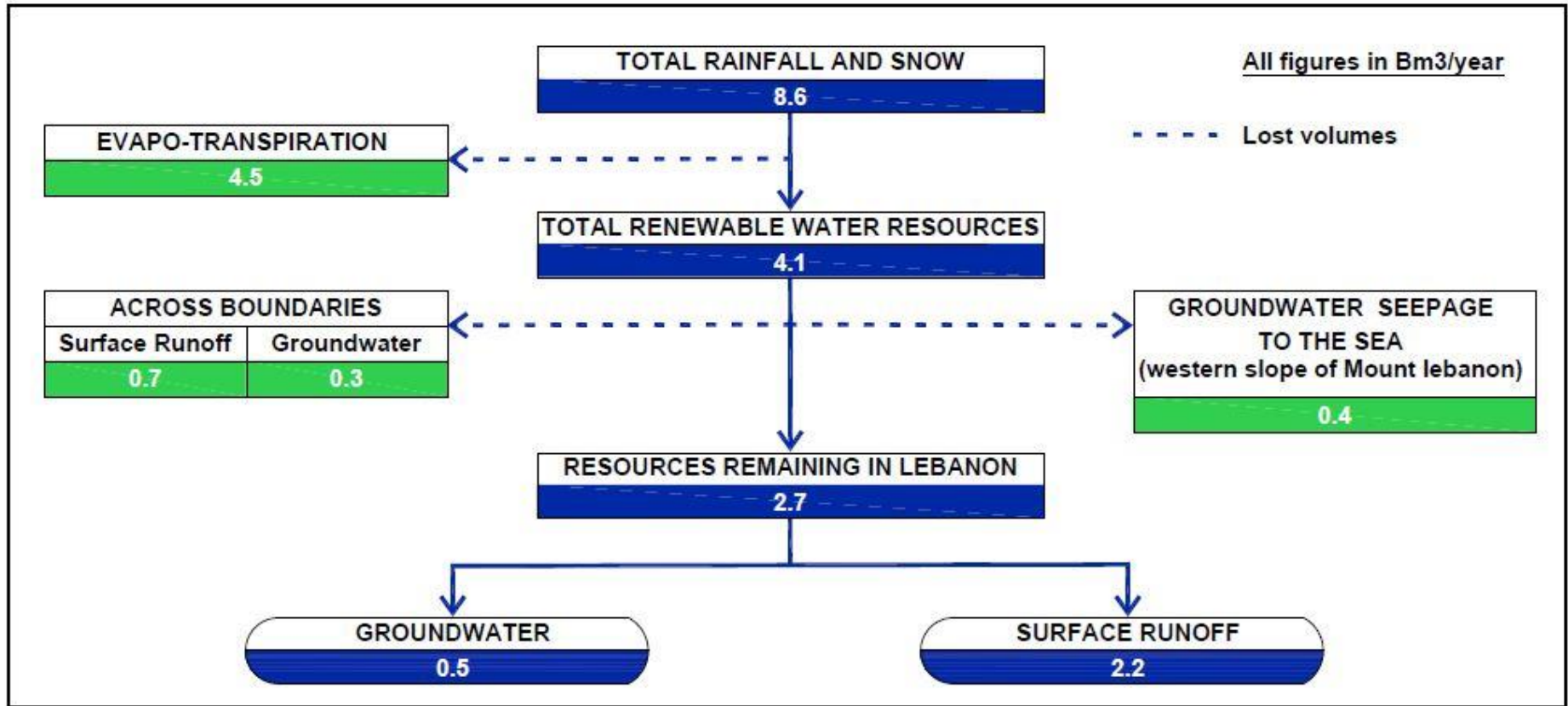


Figure III A 1 Estimated yearly available water<sup>1</sup>

**Thank you**