Assessment on the Water-Energy-Food-Ecosystems Nexus in Lebanon

Food Sector

Presented by: Maya Mhanna

Head of Rural Engineering Service Ministry of Agriculture

24 August 2022

Outline

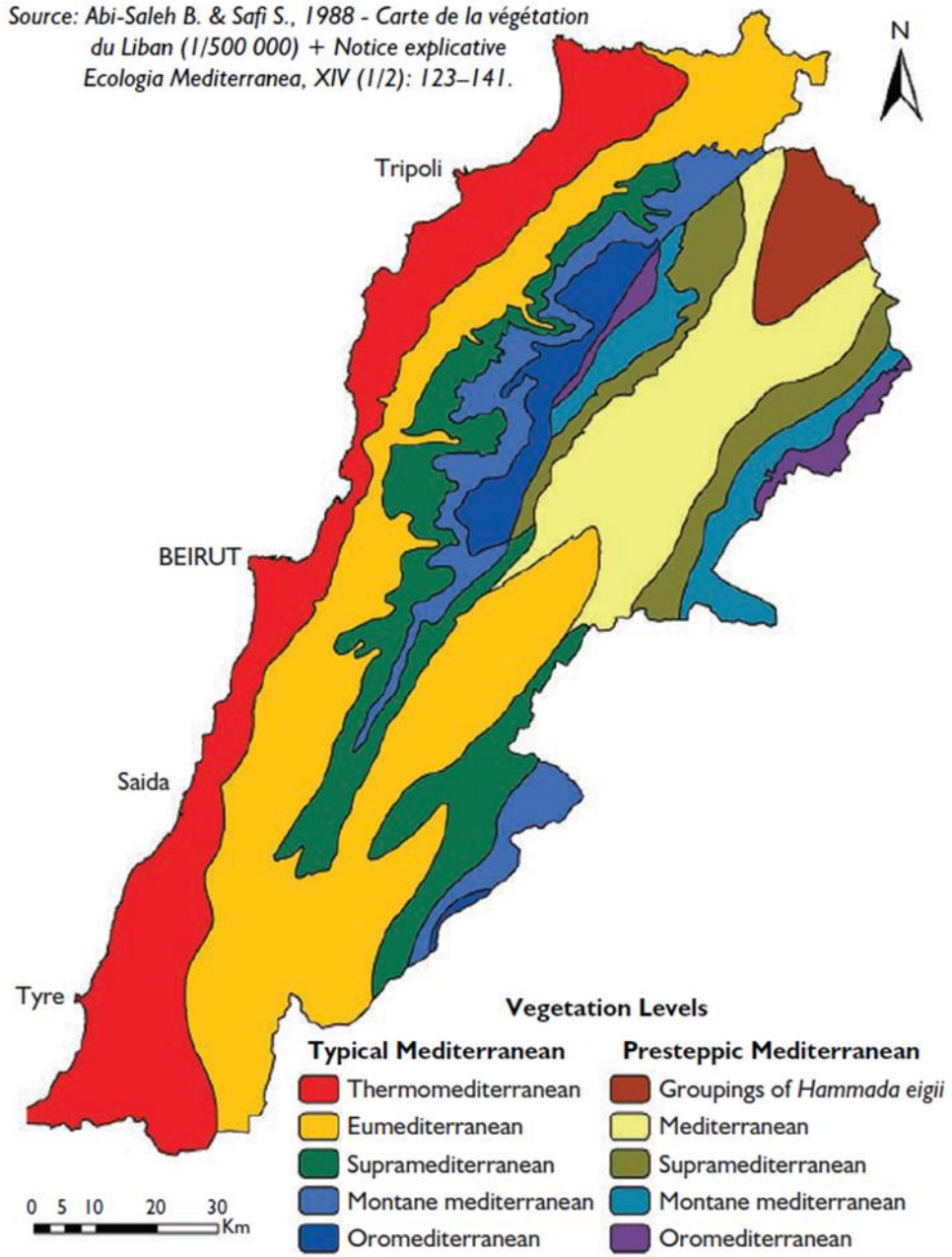
1. Brief Description of Current Situation of the Food Sector
2. The National Agriculture Strategy 2020-2025
3. Interlinkages with other sectors
4. Challenges & Threats
5. Needs and Opportunities

Current Situation

Bio-Climatic Zones

- Because of its unique geographic context and topographic characteristics, Lebanon hosts multiple microclimates, allowing for a diversity of agricultural production.
- Lebanon is divided into several bioclimatic zones, each differentiated by three factors : Mean Annual Temperatures, Latitude, Altitude

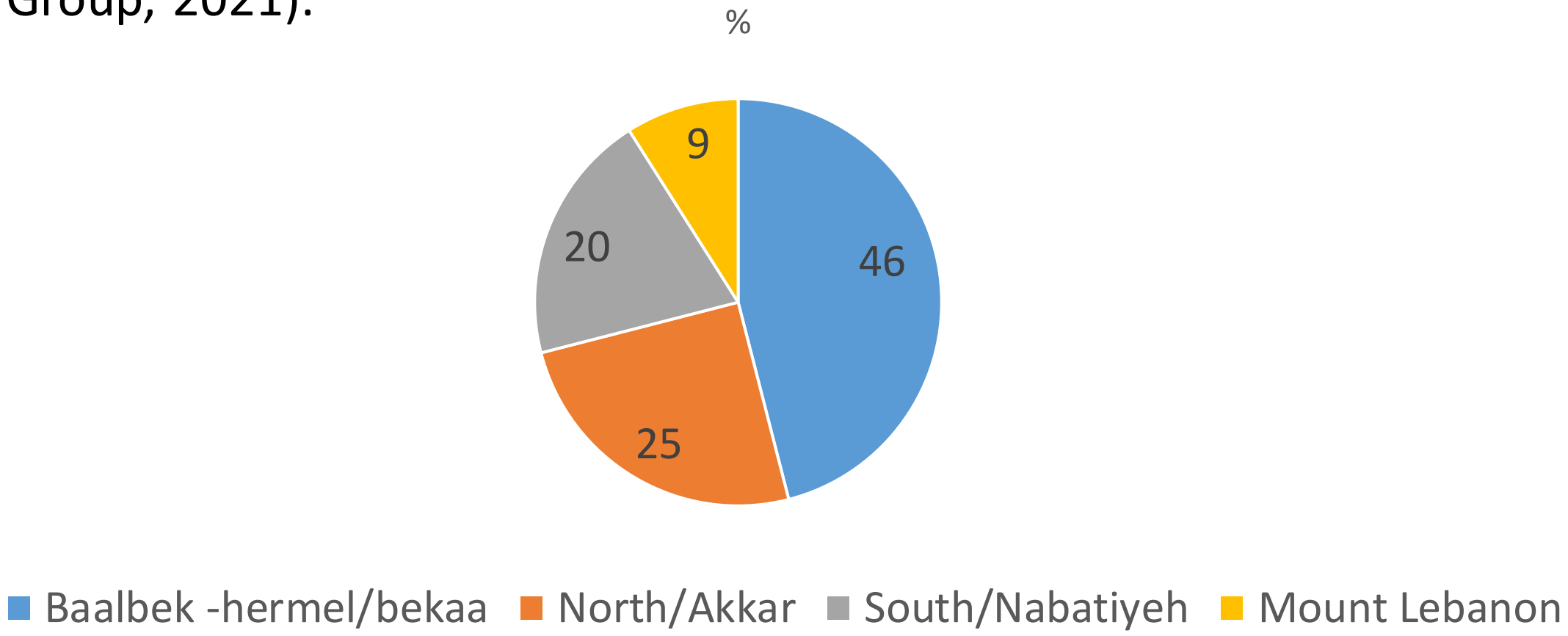
Source: World Bank Group, 2021



Agriculture Sector

- In 2018 the agriculture sector in Lebanon was responsible for 38% of the country's industrial sector's output and 2.9% of its GDP (IDAL, 2020)
- Around 21,000 individuals are employed in this sector (IDAL, 2020)
- Traditionally households have viewed agriculture as a part-time activity rather than the primary means of sustenance (Asmar, 2011)
- Actually 80% of the farmers are with small and medium farms
- 20% are considered as big famers and contributing in 80% of the agricultural production Lebanon

- According to different references total area of cultivated land in Lebanon ranges between 261,394 ha (MoA, 2017) and 232,200 ha (World Bank Group, 2021):



Agriculture Production

Table 4-4 Number of Holdings and Area of Cultivated & Irrigated Cultivated Land (World Bank Group, 2021)

Mohafazat	Number of Holdings		Cultivated Land		Irrigated Cultivated Land	
	Total	%	Area (ha)	%	Area (ha)	%
Bekaa (Baalbek and Hermel)	34,085	20	99,243	43	61,569	55
North Lebanon (with Akkar)	55,756	33	59,417	26	24,849	22
Mount Lebanon	31,178	18	20,588	9	9,396	8
Nabatiye	26,382	16	26,095	11	4,939	4
South Lebanon	22,111	13	25,621	11	12,203	11
Total	**169,512**	**100**	**230,995**	**100**	**112,956**	**100**

Table 4-5 Major Agricultural Production Sectors (World Bank Group, 2021)

Rank	Commodity	Production (1,000 USD)	Production (Metric Tons)
1	Indigenous Chicken Meat	198,091	139,069
2	Tomatoes	102,739	278,000
3	Potatoes	92,880	574,100
4	Almonds, in shell	84,103	28,500
5	Cow milk, whole, fresh	78,171	250,500

Agriculture Production

- Fruit trees and Olives occupy 134,373 ha of cultivated land.
- Annual crops occupy 113,699 ha
- Crops under rotation 127,129 ha

- Total Value of Agricultural Production in 2017 was : 2908 Billion Lebanese Lira

- 74%

26%

Plant Production

- Counts for 2157 Billion Lebanese Lira

  43% from annual crops

  57 % from Perennials

- Cereals : 45% of annual crops area

  9% of its output

- Vegetables : 41% of annual crop areas

  73% of its output

Plant Production

- Olive trees cover 23% of total cultivated land and 45% of perennial lands

Output : 25% of Perennial

- Apples and Almonds : 27 % of perennial lands

Output : 33% of perennial

- Citrus : 8%of perennial lands

Output : 17% of perennial

Olive trees

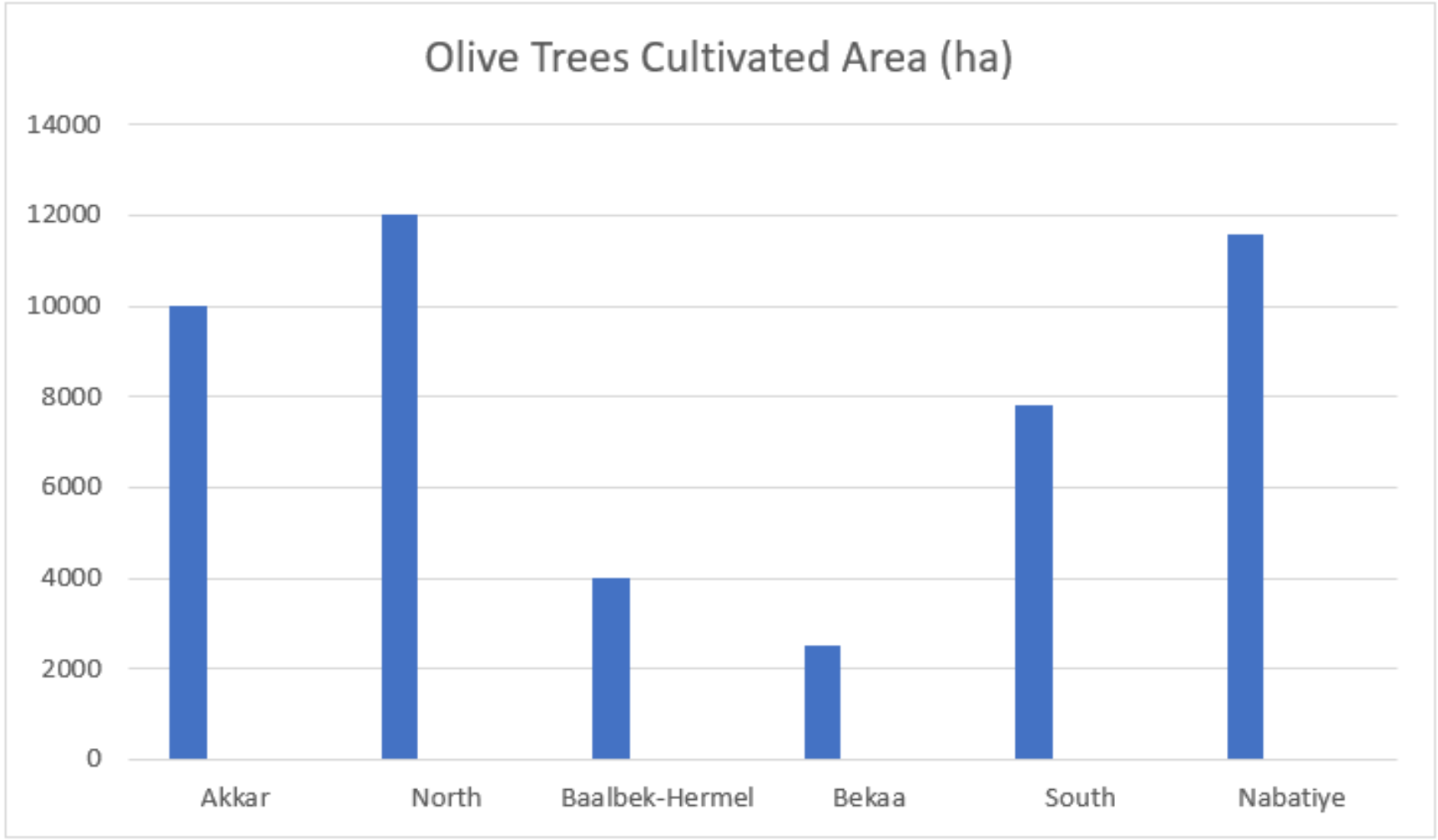


Figure 4-5 Olive Trees Cultivated Area (World Bank Group, 2021)

Animal Production

- Animal production is an important contributor to the agriculture sector
- Animal production is contributing to house well-being and poverty alleviation in Southern, Northern and Bekaa regions (IFAD, 2017).
- Chicken production progressed remarkably in 2017 contributing to 44% of the animal production outputs
- Cows contributed for 69% of all ruminants outputs of which 88% were from milk production

Imports and Exports

- Lebanon exports agricultural products that were worth 434 million USD in 2019 accounting for 11.7% of total exports of the country
- The volume of food products imported far exceed Lebanon's agricultural exports (1.6 billion USD in 2019)
- This gap is due to various reasons, such as the fact that local production does not cover the needs in many essential products (wheat, vegetable oils, etc.)
- Many local products cannot compete with the quality of foreign commodities, and the presence of large refugee populations which require nourishment that the local agriculture sector cannot sustain

Source: IDAL, 2020

Agricultural Imports

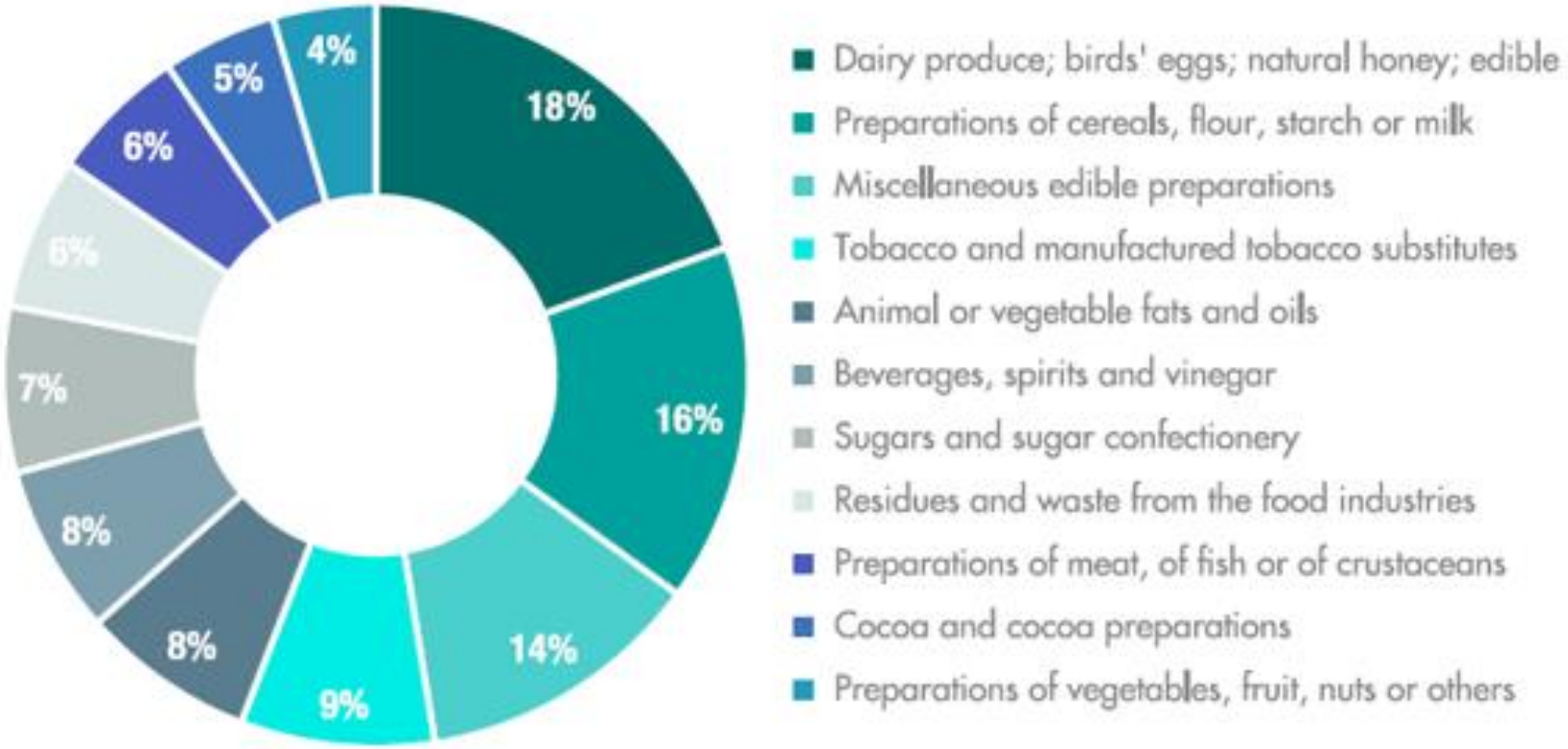


Figure 4-6 -Agriculture Imports by Percentage (IDAL, 2020)

Agricultural Exports

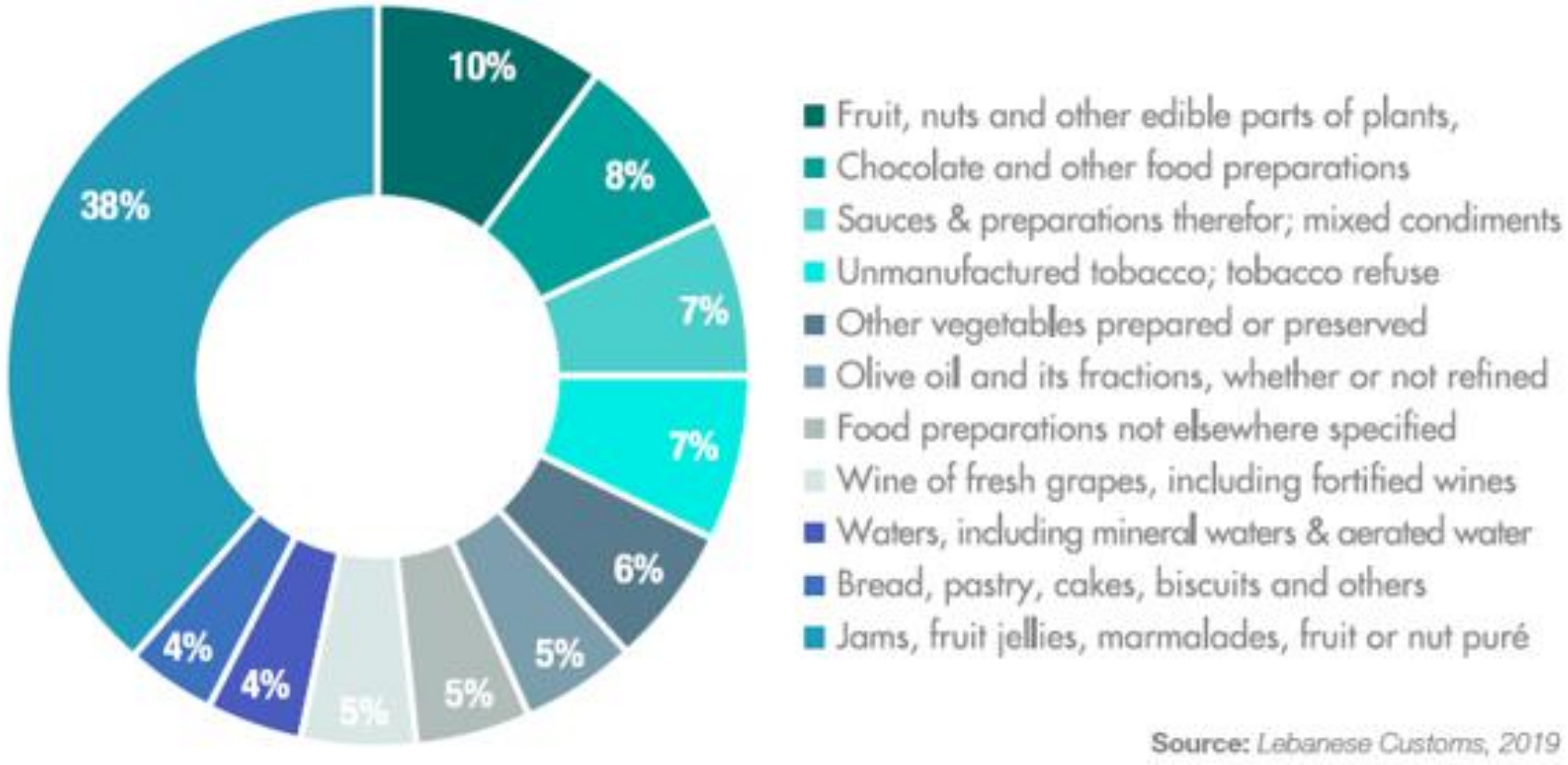


Figure 4-7 Agriculture Exports by Percentage (IDAL, 2020)

Agriculture Inputs

- Most of the inputs for the agriculture sector in Lebanon are imported (fertilizers, pesticides, animal feed, drugs and vaccines, etc.) (FAO,2020)
- Due to the financial crisis and the scarcity of hard currency to secure the import of such commodities many companies decided to halt all nutrient imports (FAO,2020)
- Such imports have become unfeasible as they significantly increase the production cost (due to the high required fertilizer quantities to be purchased using “fresh” USD) while the revenues from increased production expected through the application of these fertilizers does not increase proportionally (usually received as LBP at fluctuating rates) (FAO, 2020)

Agriculture Inputs

- The MoEW estimates that of the 1,473-1530 Mm^3 of annual water withdrawal 61% percent goes into agriculture
- This is primarily in the form of irrigation, divided into the following techniques: Sprinklers 50%, Surface 25%, Drip: 25% (MoA, 2010)
- These techniques derive their water from three types: groundwater (49%); surface waters/rivers (39%); and reservoirs, as well as hillakes (12%)

Food Security Status

- Since the beginning of the 2019 Crisis consumption patterns have been significantly altered in Lebanon and many means of nourishment have become unaffordable for a sizable amount of the population (Khater et al., 2019)
- Although food spending accounts for around 70 % of household spendings a shift is underway dedicating more to transportation and less to food (Khater et al., 2019)
- The **food basket price has increased by 557% since October 2019** and households had to adopt coping strategies such as reduction or portion sizes of number of meals per day reduction of expenditure on health an education buying food on credit and borrowing cash withdrawing children from school, and selling productive assets (LCRP, 2022)

National Agriculture Strategy (NAS) 2020-2025

NAS 2020-2025

- The Ministry of Agriculture developed a new National Strategy for Agriculture Sector (NAS) for the 2020-2025
- The long-term vision of the NAS is to “make the agrifood system a main contributor to the achievement of food security”
- Its overall objective is to “transform the Lebanese agrifood system in a more resilient inclusive competitive and sustainable agrifood system.”

NAS 2020-2025

- According to this strategy to achieve the abovementioned objective, a series of essential actions need to be implemented both at the level of the MoA and outside it. These actions include:
  - Development of human capacities in various areas (planning, management, statistics, information, and communication)
  - Engagement in policy dialogue with other involved stakeholders

NAS 2020-2025

- The NAS addressed interlinkages between agriculture and other sectors mainly through: *Improving climate change adaptation and sustainable management of agrifood systems and natural resources:*
  - Increase climate change adaptation and encourage related private investment along the agrifood value chains
  - Promote sustainable use of natural resources
  - Enhance the efficient use of irrigation water and expand the supply of water resources for irrigation
  - Encourage and support the use of RE in the agricultural sector

Interlinkages with other Sectors

Interlinkages

- Agricultural production is highly dependent on water supply, in terms of availability and quality
- Certain crops are dependent on a steady supply of water year-round to be able to sustain the crops to be cultivated
- Water quality affects agricultural production: poor quality/ polluted water reduces the quality of produce thereby decreasing its acceptability for export and threatening public health

Interlinkages

- Water pollution and scarcity, and the high cost of water supply (pumping and/or transportation by cisterns) associated with high energy cost, lead to higher cost of agriculture production
- Shortages in power supply are causing unsafe food storage conditions leading to various instances of food poisoning
- Increased fuel prices affect the transportation feed of food stuffs, including imported items, thereby reducing accessibility to food for of low-income population

Challenges & Threats

Challenges & Threats

- Lack of farmer status under the labor act that does not contain any specific provision for farmers
- Low productivity and competitiveness due to small or medium-sized holdings
- Haphazard urbanization leading to the loss of valuable agricultural land and topsoil, and increasing pollution of water and soil
- Lack of skills capacities and knowledge among farmers in rural area of the new farming methods which would promote productivity and competitiveness of their products
- Climate change expected to reduce agricultural production due to water scarcity, decreased soil fertility spread of pests and diseases etc…

Challenges & Threats

- Natural hazards particularly related to weather events
- High production cost of various agricultural products mainly due to most of the inputs being imported
- Irrigation inefficiency
- Lack of available funds to modernize their operations with technology since most machinery is imported
- Use of Polluted Water either by exploiting polluted natural water resources or by untreated wastewater for agriculture

Needs and Opportunities

Needs

- **Technical**: adoption of water saving and sustainable production method
- **Financial**: need to increase funding in the sector
- **Administrative**: filling vacancies in the public sector prohibiting proper management
- Protecting agricultural labor and provision of certain form of social security
- Capacity building for various stakeholders to reduce environmental impact of agricultural production, increase productivity and competitiveness

Opportunities

- Production of high revenue crops and essential crops enhancing food security
- Adoption of sustainable agricultural practices that reduce water and energy consumption and regulate the use of inputs, thereby increasing productivity and reducing production cost
- Local production of agriculture sector inputs, including the production of compost from sorted at source organic material to replace imported fertilizers
- Reuse of adequately treated wastewater, under continuous monitoring
- Use of renewable energies where applicable to reduce operational cost of farms and agro-processing facilities

References

- Asmar, F. (2011). Country pasture/forage resource profiles, Lebanon. FAO, Rome http://www.fao.org/ag/agp/agpc/doc/counprof/lebanon/lebanon.html
- Dal, E., Díaz-González, A.M., Morales-Opazo, C. & Vigani, M. 2021. Agricultural sector review in Lebanon. FAO Agricultural Development Economics Technical Study No. 12. Rome, FAO. https://doi.org/10.4060/cb5157en
- FAO. (2020). Special report: FAO mission to assess the impact of the financial crisis on agriculture in the Republic of Lebanon. Retrieved June 29, 2022, from https://reliefweb.int/report/lebanon/special-report-fao-mission-assess-impact-financial-crisis-agriculture-republic
- Agriculture Sector in Lebanon 2020 Factbook. (2020). Retrieved June 29, 2022, from https://investinlebanon.gov.lb/
- Agri-Food Industry 2020 Factbook. (2020). Retrieved June 29, 2022, from https://investinlebanon.gov.lb/
- Harmonised Actions for Livestock Enhanced Production and Processing (HALEPP), Detailed Design Report, IFAD, 2017
- Khater, M., El Balaa, R., Bachawati, E., Mouannes, E. (2019). The Agro-Food Sector in Lebanon.
- "National Agriculture Sector Strategy 2020-2025, July 2020
- Verner, D., Ashwill, M., Christensen, J., Mcdonnell, R., Redwood, J., Jomaa, I., ... & Treguer, D. (2018). Droughts and Agriculture in Lebanon., World Bank Group 2021
- "Successful Stories in Adapting to Climate Change", presented by Maya Mhanna, UNESCWA – Beirut 15-17 February, 2016

Thank You!