You reap what they sow

Understanding the issues linked to the agricultural sector in Lebanon

Introduction

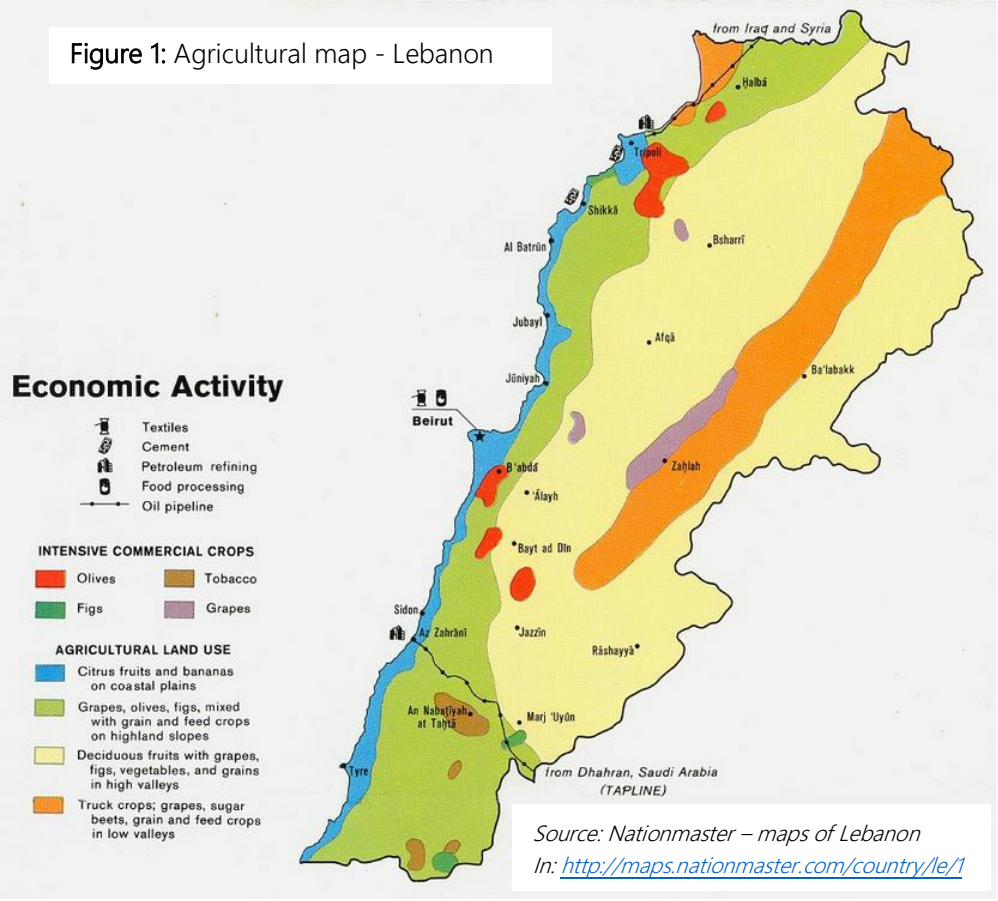
Agriculture suffers generally from a quite degraded and old fashioned image in most countries of the world while farmers are often perceived as backward people who missed the train of modernity in the collective imagination of urban populations. Nowadays, supermarkets spread out over the landscapes, which help disseminate a fake representation of the link between food and agriculture, making us forget about the process of food production, hiding this obvious link from the eyes of the consumers with the help of advertisement, packaging and other asepticized artefacts. Nonetheless, agriculture played and will always play a crucial role in every society as its main function is to fulfill a basic need; namely to feed the population. Lebanon, a small country from the Middle East, has a specific link to food and agriculture. Beyond the pride of Lebanese people for their cuisine and their worldwide renowned 'hummus', the country of the Cedars enjoys an especially favorable climate for agriculture. Indeed, located within a mostly arid region made up of deserts, Lebanon is an absolute agricultural Eldorado enjoying astonishing climatic conditions allowing for a diverse agricultural production as well as generous water availability (2.2 billion m^3 /year[1]) and thus profiting from a high productivity potential. Located within the Mediterranean Fertile Crescent, the country can be divided into five main agricultural areas.[2] Both Lebanese mountains; namely Mount-Lebanon and Anti-Lebanon, at high altitude and enjoying a substantial amount of precipitation, are adequate for the production of apples and some other vegetables. The slopes are adapted to the cultivation of olive and almond trees, as well as grapes. The Bekaa Valley is located between the mountains and is a vast fertile

[1] Investment Development Authority of Lebanon (IDAL). Agriculture Sector – 2017 Factsheet. In:http://www.investinlebanon.gov.lb/Content/uploads/SideBlock/1710100124590 18~Agriculture%20factsheet%202017.pdf

[2] HAMADE, Kanj et al. Contrasting Quantitative and Qualitative Approaches to Rural Development Analysis: The Case of Agricultural Intensification in Lebanon. *Journal of Agriculture Economics,* Vol. 66, No. 2: 2015. P.494.

plateau, ideal for the production of vegetables, fruits, grapes but also cereals. In the Northern part of the country, potatoes and cereals are being produced while in the South, a less irrigated zone, potatoes and tobacco are the main cultivated crops. Finally, despite the narrowness of the coastal strip, the latter is especially productive for the cultivation of citrus fruits and bananas (Figure 1).[3] This privileged link to agriculture should enable the country to excel in this sector.

Figure 1: Agricultural map - Lebanon



Source: Nationmaster – maps of Lebanon
In: http://maps.nationmaster.com/country/le/1

However, the state of agriculture in Lebanon is far from glamourous. Indeed, food security (i.e. ensuring food availability, access and utilization, and the stability of these three conditions over time)[4] remains a challenge and the country is dependent on cereal imports as 83% of consumed cereals comes from abroad.[5] Agriculture is dramatically neglected in the economy in favor of the tertiary sector, supporting mainly finance and real estate. In this neoliberal environment, conventional agriculture, characterized by monoculture, mechanization and the use of phytosanitary products is supported in order to increase yields and to compete on the world market. Within the Lebanese context, other issues are often claimed to be more important as the country is suffering from the lack of basic infrastructure such as electricity and water supply or waste

[3] BLANC, Pierre. Chapitre 2. La terre libanaise. Lieu de pouvoir, lieu de déshérence. In : *Proche-Orient. Le pouvoir, la terre et l'eau.* Presses de Sciences Po (P.F.N.S.P.) : 2010. P.60.
[4] FAO. Policy Brief – Food Security. Issue 2, June 2006.
In: http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf
[5] FAO. Country Briefs – Lebanon. July 2017.
In: http://www.fao.org/giews/countrybrief/country.jsp?code=LBN

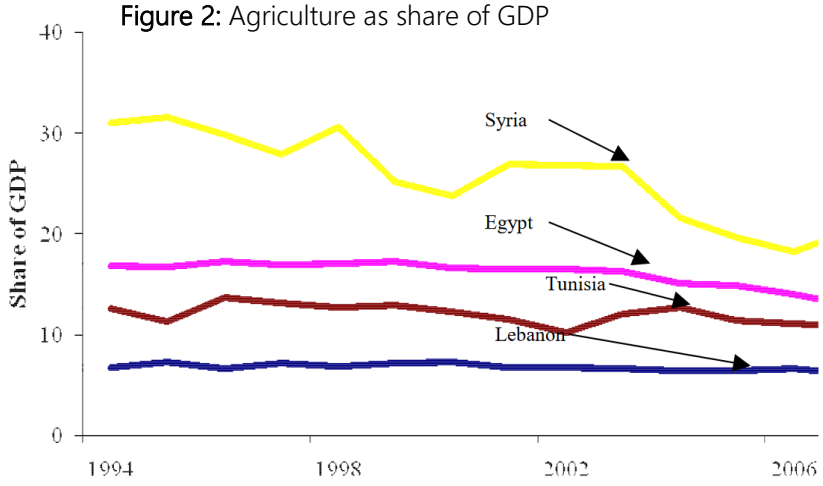
management. However, agriculture can be considered as a major public concern as it has a strong impact on the environment, it involves social concerns and at the same time represents an important economic lever. Indeed, aside from its ecological significance, the sector requires a substantial labor force, creating employment. Furthermore, it creates social links and enables the upholding of active lives outside of cities, giving rural populations the opportunity to acquire autonomy at a time when urbanization is advancing at a staggering rate in the absence of legal regulations. Given all the issues linked to agriculture, it is of interest to take a closer look at the agricultural sector in Lebanon. What is the state of agriculture in the country? How come? What about alternative agriculture? Can alternative food systems improve the situation?

After having examined the current state of agriculture in Lebanon, this article will investigate the implications of the Lebanese food production system and will try to identify the reasons underlying this situation. Finally, the article will shed light on the emergence of a form of 'alternative agriculture' and will try to understand whether or not it can be a sustainable solution to assure food security in the country in the face of rapidly advancing climate change.

Macroeconomic overview

Numbers can quickly become abstract for a lay person. Nevertheless, they give precious clues about the place of agriculture in the wider Lebanese economic picture. Although data (especially recent data!) is hard to collect in Lebanon, thus making it difficult to obtain an accurate overview of the current situation, one can still gain a general understanding of the macroeconomic situation by looking at the overall trends. In 2017, the agricultural sector contributed to 3.5% of the GDP[6],

Figure 2: Agriculture as share of GDP



Source: World Bank. Lebanon agriculture sector note: aligning public expenditures with comparative advantage. Washington: 2010.

[6] Investment Development Authority of Lebanon (IDAL). Agriculture Sector – 2017 Factsheet.

which is quite low in comparison to other countries of the region[7] (Figure 2). Between 2006 and 2011, the wealth generated by Lebanese agricultural production increased by 11% whereas the national GDP increased by 32.5% in the same period. Agriculture hence stays in the background of the Lebanese economy.

However, while looking at the data, one can easily realize that agriculture still remains a crucial and even vital sector for a substantial part of the population, particularly for its poorest members: of the estimated 170 000 farmers or land-holders, half depend solely on the agricultural sector to secure their livelihoods[8] and about 60% of the overall population relies directly or indirectly on agricultural activities.[9] If in 2009 the agricultural sector represented 6% of the total labor force, it reached 25% of the labor force in rural areas, generating up to 80% of the GDP of some areas. Besides this, the population located in the agriculturally productive zones such as the Bekaa Valley is the population suffering the most from poverty.[10] Agriculture is the sector where the rate of poverty is the highest and in some regions, for instance the North governorate, poverty rate reaches 52.57% of the population with one in four farmers living below the poverty line.[11] Agriculture is thus a crucial lever to rural development to provide agricultural workers with stable incomes and to fight against poverty. However, the average budget allocation to the Ministry of Agriculture was only 67 billion LBP in 2013, which represents a mere estimated 0.5% of the total public expenditures.

Direct consequences of conventional agriculture in Lebanon

In the dominant paradigm, in other words the "prominent worldview, model or frame of reference through which individuals, or collectively, a society interpret the meaning

In:http://www.investinlebanon.gov.lb/Content/uploads/SideBlock/1710100124590 18~Agriculture%20factsheet%202017.pdf

[7] World Bank. Lebanon agriculture sector note: aligning public expenditures with comparative advantage. Washington: 2010. In: http://documents.worldbank.org/curated/en/685551468057242124/Lebanon-agriculture-sector-note-aligning-public-expenditures-with-comparative-advantage P.2.

[8] Ibid. P.2.

[9] FAO. Overview of Food Security Situation in Lebanon. RFSAN Situation Report. July 2015. In: http://www.fao.org/3/a-az721e.pdf P.1.

[10] HAMADE, Kanj et al. Contrasting Quantitative and Qualitative Approaches to Rural Development Analysis: The Case of Agricultural Intensification in Lebanon. *Journal of Agriculture Economics,* Vol. 66, No. 2: 2015. P.497.

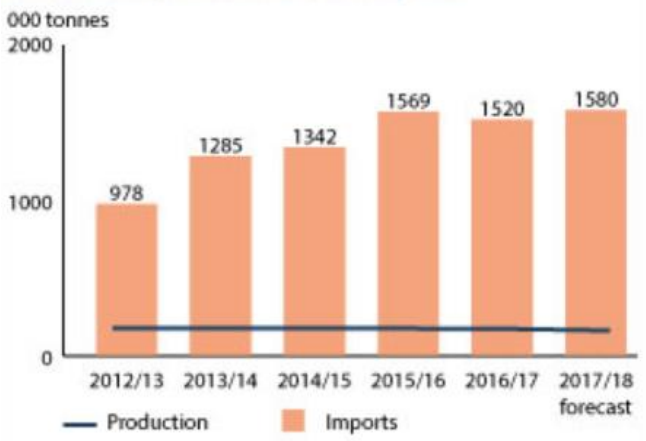
[11] World Bank. Lebanon agriculture sector note: aligning public expenditures with comparative advantage. Washington: 2010. In: http://documents.worldbank.org/curated/en/685551468057242124/Lebanon-agriculture-sector-note-aligning-public-expenditures-with-comparative-advantage P.3.

of the external world"[12], conventional agriculture is considered as the norm because it is seen as the most efficient way to feed the growing world population. In this article, conventional agriculture, industrial agriculture and intensive agriculture are used interchangeably and refer to "capital-intensive, large scale, highly mechanized agriculture with monocultures of crops and extensive use of artificial fertilizers, herbicides and pesticides, with intensive animal husbandry"[13].

Food insecurity

The current state of agriculture in Lebanon has direct consequences on people, such as the weakening of food security. As a reminder, food security is commonly referred to when "[…] all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life"[14], as elaborated by the World Food Summit delegates in 1996. Coming back to Lebanon, the country suffers from food insecurity. Indeed, it produces only about 17% of its cereal consumption (mainly wheat and maize) and is therefore heavily dependent on imports that represent more than 80% of total consumption. According to a forecast for 2017/2018, these imports represent around 1.6 million tonnes[15] (Figure 3). As a result, from a macroeconomic perspective, there is no doubt that Lebanon suffers from heightened food insecurity. A study conducted in 2016 by the World Food Program (WFP) in the country of the Cedars reveals that 49% of the Lebanese are worried about their ability to get sufficient food products. Moreover, in the same study, 31% of the population is unable to consistently consume healthy and nutritional foodstuff

Figure 3: Lebanon total cereal production and imports



Source: FAO. Country Briefs – Lebanon. July 2017.

[12] BEUS, Curtis E./ DUNLAP, Riley R. Conventional versus Alternative Agriculture : The Paradigmatic Roots of the Debate. *Rural Sociology*, Vol. 55, No. 4: 1990. P.593.
[13] KNORR, Dietrich/WATKINS, Tom R. (Eds.). Alterations in Food Production. Van Nostrand Reinhold, New York: 1984. P.x.
[14] FAO. Policy Brief – Food Security. Issue 2, June 2006.
In: http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf
[15] FAO. Country Briefs – Lebanon. July 2017.
In: http://www.fao.org/giews/countrybrief/country.jsp?code=LBN

throughout the year.[16] When one considers that the Bekaa Valley was once the center of food production for the entire Roman Empire[17], the current state of food insecurity in Lebanon can legitimately appear a cruel turnaround of circumstances.

Contamination rate of foodstuff and water

The use of pesticides is a cornerstone of conventional agriculture. They are chemicals that aim at controlling pests, such as insects or bacteria attacking the crops, in order to be more productive. Pesticides are "inherently toxic, are classed as semi-volatile organic compounds and include a variety of chemicals in various forms"[18]. Lebanon sadly holds the record in pesticide-use in the Middle East. Indeed, based on the rate of the years 1993-2002, the country is ranked first in the region with a rate of almost 5.5kg of pesticide per hectare. This amount is two to three times higher than the amount used in Egypt or in Jordan.[19] The ex-Minister of the Environment Antoine Karam revealed in 2009 in a study focusing on vegetables and fruits in different regions in Lebanon that pesticide residues exceeding international norms were detected in most of the analyzed crops. According to this study, on average, 40% of the crops are contaminated and it can reach 58% in some regions such as in the southern part of the country.[20] It is also worth mentioning that the rate varies according to the kind of crop cultivated: while "only" 14% of lemons contain residual traces of pesticides, no less than 100% of zucchinis are contaminated.[21] For its part, water does not escape the contamination by pesticide residues either. The Lebanese Agricultural Research Institute (LARI) published a study conducted in different areas in Lebanon testing the conformity of the water from reservoirs, rain, rivers and springs with the standards of chemical analysis. The non-conformity of the samples can reach as much as 85% in Hasbaia or 80% in Baaklin, while the average rate of non-conformity of water in the 8 different areas analyzed

[16] World Food Program. Plan stratégique de pays – Liban (2018-2020). Rome: June 2017. In: http://documents.wfp.org/stellent/groups/public/documents/eb/wfp291590.pdf P.1.
[17] ESCWA. Strategic Review of Food and Nutrition Security in Lebanon. May 2016. In: https://www.wfp.org/content/strategic-review-food-and-nutrition-security-lebanon P.11.
[18] Ministry of Environment – Republic of Lebanon. Development of National Implementation Plans for the Management of Persistent Organic Pollutants. *Preliminary Pesticides Inventory*. 2005. In: http://test.moe.gov.lb/pdf/Pops/National%20Inventory%20on%20POP%20Pesticides.pdf P.10.
[19] BASHOUR, Isam. Chapter 10. Pesticides, Fertilizers and Food Safety. In: *Arab Environment: Future Challenges.* AFED. TOLBA, Mostafa K./ SAAB, Najib W. (ed.): 2008. P.140.
[20] CHEHAITA, Bilal/ IBRAHIM, Manale. L'agriculture au Liban: la nécessité d'une transition vers l'agriculture durable. *National Defense Magazine*, No. 92: April 2015.
[21] Ibid.

throughout Lebanon are up to 59.5%.[22] The link between the intensive use of pesticides by industrial agriculture in Lebanon and the contamination rate of foodstuff and water by pesticide residues is no secret. It is unfortunately only one example of a source of contamination and illustrates a reality related to the current system of agricultural production.

Pauperization of farmers

The prevalence of conventional industrial agriculture in order to be able to be productive in a highly competitive environment brought about economic problems that farmers have to face in the rural areas of Lebanon. Indeed, farmers face high inputs costs (such as seeds, fertilizers, pesticides…), leading them into a vicious circle of debt and credit, dramatically reducing their autonomy. Likewise, the rise in price for fuel leads to a higher price for transportation, storage, equipment, and irrigation systems as well as higher prices of pesticides and fertilizer.[23] Another issue that farmers have to face in the absence of agricultural cooperatives in the country, is the lack of market power. Farmers are usually dependent on middle men to make the connection between the farmer and the consumer to sell their produce, and middle men often take advantage of the farmers in the absence of state regulation or protection for farmers. For instance, traders have the ability to store the produce and can thus make enormous profit in the off-season without paying the farmers as much as they should. A common practice among middle men is to underreport the profit to the farmers who are powerless to claim their dues.[24] Farmers also experience difficulties to gain access to international markets because of their lack of competitiveness as well as their inability to respect international sanitarian standards (for instance as seen previously, the rate of pesticide residues). The absence of a Government that monitors and supports good agricultural practices hinders farmers from reaching export markets, which leads to an oversupply in the local market, which subsequently leads to the lowering of prices.[25] The consequence of such a cycle is naturally the impoverishment of the farmers located in rural areas, where agriculture is responsible for the majority of the income. The poverty index in agricultural areas reaches 52.57% of the North governorate population (out of

[22] Data from the Lebanese Agricultural Research Institute (LARI): see Appendix 1.
[23] ALLAM, Nathalie. *Farming is Gambling: An Examination of the Decline of Produce Farming in Lebanon's Central Bekaa Valley*. Doctoral dissertation, The George Washington University: 2011. P.14.
[24] Ibid. P.35.
[25] Ibid. P.36.

which 17.75% is extremely poor) and 29.36% in the Bekaa (out of which 10.81% is extremely poor).[26] Pauperization of farmers in rural areas is thus a direct consequence of intensive agriculture in which being competitive on the regional or world market is a sine qua non condition (though rarely met) to cover farmers' costs (who, on top of that, are usually highly indebted).

Hidden consequences of industrial agriculture

Social and political implications of a heightened food insecurity

Lebanon is highly dependent on cereal imports and experiences large fiscal deficits. It renders the country extremely vulnerable to price fluctuations and production shortages. The Government has only a restrained financing option due to its deficit in case of a price shock. Moreover, the high dependence on imports and the lack of fiscal resources make it complicated to address an acute shortage of foodstuff and can as a result require external aid in order to avoid famine.[27] Lebanon's vulnerability is not expected to get better in the coming years. It is worthwhile to take a look at the assumptions proposed by IFPRI to get a reliable picture of this phenomenon. The projected net cereal imports into the country for the time period 2000-2030 are expected to rise by 52%.[28] In other words, the import dependency of Lebanon has no end in sight (let's face it: not even a reduction can be considered), thus offering little hope for the strengthening of the food security in the country. Besides the dramatic consequences of hunger and poverty due to the food insecurity, food scarcity can also trigger tensions, unrest and food riots.[29] As shown by Rami Zurayk, access to food and social stability are closely linked[30] and food prices, among other factors, played a substantial role in the Arab Uprisings of 2012.[31] Furthermore, a work by Eckhart Woertz reminds us that food can be used as a political weapon, especially when food security

[26] HAMADE, Kanj et al. Contrasting Quantitative and Qualitative Approaches to Rural Development Analysis: The Case of Agricultural Intensification in Lebanon. *Journal of Agriculture Economics,* Vol. 66, No. 2: 2015. P.496. See appendix 2.
[27] World Bank. Improving Food Security in Arab Countries. January 2009.
In: http://siteresources.worldbank.org/INTMENA/Resources/FoodSecfinal.pdf P.15.
[28] Ibid. P.19
[29] United Nations. Chapter IV. The global food crises.
In: http://www.un.org/esa/socdev/rwss/docs/2011/chapter4.pdf P.61.
[30] For a detailed study on the link between food and social stability, see: ZURAYK, Rami. Food, Farming, and Freedom: Sowing the Arab Spring. Just World Books: 2011.
[31]ZURAYK, Rami. Use your loaf: why food prices were crucial in the Arab Spring. *The Guardian*, 17 July 2011. In: https://www.theguardian.com/lifeandstyle/2011/jul/17/bread-food-arab-spring

in a country relies almost entirely on trade as is the case in the Middle East.[32] Food security is thus a condition for an effective sovereignty and political independence from other countries or private interests. When one knows that three American agrifood companies (namely Cargill, ADM and Bunge) have a stranglehold on 90% of the grain trade in the world[33], improving food security quickly becomes a priority for achieving political emancipation. This shows that many issues impacting the social, political and economic spheres lie in the concept of food security and the ability to insure it, which significantly weakens Lebanon's leeway.

The vicious cycle of climate change

Agriculture is highly dependent on local climate conditions and physical characteristics like the quality of the soil. This is especially important to consider when noting that the Middle Eastern region is particularly exposed to environmental risks, specifically the rural areas. Indeed, it is one of the most water scarce regions of the world, which will have to face temperature rise and its related effects such as soil degradation.[34] Moreover, annual precipitation is expected to fall and could be reduced by 10 to 20%, exacerbating water-scarcity and constraints for its agricultural use.[35] The International Food Policy Research Institute recently published a study showing projections of the impacts of climate change on crop yields which could lead to reductions of up to 30% for rice, 47% for maize and 20% for wheat.[36] Conventional agriculture is negatively affecting the environment, which brings about negative effects of climate change on agriculture, which is in turn weakening food security in the region and in Lebanon. This is nothing more and nothing less than a vicious circle reinforcing itself through the dynamic of intensive agriculture. Lebanon's climatic blessing is progressively spoiled and will not enable the country to avoid the irreversible effects of climate change.

[32]For a detailed study on food as a political weapon, see: WOERTZ, Eckart. Oil for Food. The Global Food Crisis and the Middle East. Oxford University Press: 2013.
[33] ZURAYK, Rami. Use your loaf: why food prices were crucial in the Arab Spring. *The Guardian*, 17 July 2011. In: https://www.theguardian.com/lifeandstyle/2011/jul/17/bread-food-arab-spring
[34]World Bank. Increasing resilience to climate change in the agricultural sector of the Middle East: the cases of Jordan and Lebanon. 2013.
In:http://documents.worldbank.org/curated/en/115381468249300050/Middle-East-Increasing-resilience-to-climate-change-in-the-agricultural-sector-of-the-Middle-East-the-cases-of-Jordan-and-Lebanon P.2.
[35] Ibid. P.2.
[36] Ibid. P.3.

Long term impact on public health

In conventional agriculture, farmers are dependent on the use of pesticide to combat pests attacking their crops.[37] As we have seen previously, farmers in Lebanon have the bad habit to overuse pesticides in comparison with other countries of the region. Yet, pesticides are far from being harmless. The exposure to these chemicals have a well-known negative effect on health that vary depending on the degree of exposure and it can even lead to cancer in some cases.[38] Why are products in Lebanon contaminated so frequently? The issue is linked to the applied quantities of pesticides and the preventive waiting period, which requires a minimum amount of time to elapse between application of the pesticide and the eventual harvest of the crops, both of which are often disregarded. Farmers, in order to make more profit under the pressure of competition, proceed to the harvesting process before the end of this preventive waiting period, selling toxic food to the consumer.[39] As the State is not regulating the rate of pesticide residues, farmers have the incentive to apply more pesticides in order to be more productive, paving the way for an increasing rate of health concerns related to these contaminations.

Factors shedding light on the current situation

The often common image of Lebanon abroad is linked to a situation of conflict, which is easily understood by looking at the country's history, from the Civil War to the 2006 Israeli War and the current Syrian War at its border. Needless to say, the geopolitical seismicity of the country plays a major role in the development of the agricultural sector (Israeli occupation in the rural south, destruction of strategic agricultural places during the wars (water canal, storing locals…), illicit cultivation, etc.).[40] However, it is interesting to take a look at other factors in order to gain an in depth understanding of the vulnerability of the sector.

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[37] BASHOUR, Isam. Chapter 10. Pesticides, Fertilizers and Food Safety. In: *Arab Environment: Future Challenges.* AFED. TOLBA, Mostafa K./ SAAB, Najib W. (ed.): 2008. P.141.
[38] Ministry of Environment – Republic of Lebanon. Development of National Implementation Plans for the Management of Persistent Organic Pollutants. *Preliminary Pesticides Inventory.* 2005. In: http://test.moe.gov.lb/pdf/Pops/National%20Inventory%20on%20POP%20Pesticides.pdf P.10.
[39] CHEHAITA, Bilal/ IBRAHIM, Manale. L'agriculture au Liban: la nécessité d'une transition vers l'agriculture durable. *National Defense Magazine*, No. 92 : April 2015.
[40] For a detailed study on the impact of the geopolitics on the agriculture in Lebanon, see: BLANC, Pierre. L'agriculture au Liban : entre contraintes géopolitiques et retrait du politique. *Maghreb – Machrek,* Vol. 215, No. : 2013.

A laissez-faire State

The state of the agricultural sector in Lebanon can be explained, in part, by the historical evolution of the country and the strategic choices made for the economy. After the declaration of independence of Lebanon, a liberal growth-oriented economic system was chosen by the Government as a mean to drive the development of the country. Hence, the policy substantially supported the tertiary sector over any other sector such as agriculture, developing mostly cities on the coast.[41] Under the mandate of President Khoury (1943-1952), Lebanon aimed to become a liberal trade republic with the ambition to be an unavoidable hub of Mediterranean business.[42] Contrary to the other countries in the region, which tried to achieve food security after World War II, Lebanon never undertook agricultural reforms, leading to the absence of a suitable legal framework to support the development of the agricultural sector, which lasts to this day. The Civil War (1975-1990) led to the weakening of the economic structure of the country. The budget deficit substantially increased, capital outflows were massive, and the inflation rose as well as poverty, weakening the entire economy.[43] History repeating itself, after the end of the war, no policy for a proper agricultural development was elaborated. In line with the political decision from the post-independence era, the model followed by Prime Minister Rafic Hariri favored the coastal areas through the tertiarisation of the economy and the promotion of services.[44] Since then, the policy choices from the governments in power remained in line with the existing trend.

On the one hand, the insufficiency of public policy in the agricultural sector deeply contributed to the rise of the agro-industry, which contributed in turn to the imbalanced development of territories, triggering the pauperization of the rural areas. Indeed, with the lack of political will to support an agricultural sector weakened by the Civil War, private investments combined with the reinforcement of a liberal trade policy triggered the recovery and the strengthening of the agro-industrial activity. This revival benefited specific actors, namely big enterprises integrated in the international market at the cost

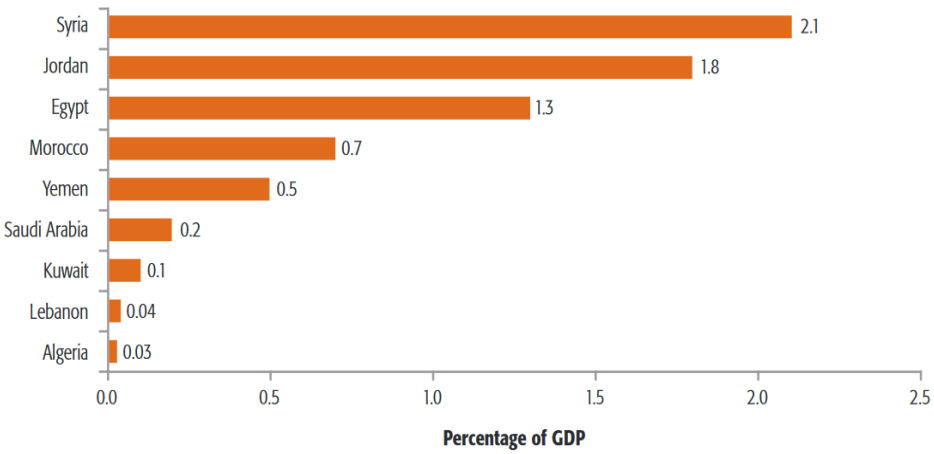
41 BLANC, Pierre. Proche-Orient: géopolitique des dynamiques agraires. *Hérodote*, Vol. 156, No. 1: 2015. P.11.
42 BLANC, Pierre. Développement régional et cohésion « nationale ». *Confluences Méditerranée,* Vol. 56, No. 1: 2006. P.122.
43 DARWISH, R et al. The 2006 war and its inter-temporal economic impact on agriculture in Lebanon. *Disasters*, Vol. 33, No. 4: 2009. P.630.
44 BLANC, Pierre. Proche-Orient: géopolitique des dynamiques agraires. *Hérodote,* Vol. 156, No. 1: 2015. P.21.

of small farmers, emphasizing the distortion of inequalities in the sector.[45] This situation explains the hegemony of conventional industrial agriculture (the only form able to be competitive enough to survive on the market) and its disastrous consequences evoked previously.

On the other hand, the neoliberal policies led to a dramatic lack of State intervention. Many issues, crucial for the regulation of the agricultural sector (such as property law, the status of the farmers, the status of arable land or the hydraulic policy to mention just a few[46]) are left unresolved because of the neoliberal policies coupled with a Government not thought to be accountable, making agricultural development difficult. This is not to mention the really low share of food subsidies in the Lebanese GDP (0.04%) in comparison with other countries from the region (for instance in Jordan where it represents 1.8% of the GDP)[47] (Figure 4), leaving farmers with no financial support on top of the complete absence of a legal framework on which they could rely.

It is clearly hard to slip out of this dynamic but it is urgently needed as it harms the environment, it affects public health and does not contribute to (indeed deteriorating) the rural development or the amelioration of living conditions of farmers in Lebanon.

Figure 4: Food subsidies as a share of GDP



Source: World Bank. Improving Food Security in Arab Countries. January 2009.

Failure of external aid

Plenty of international organizations, as well as non-governmental organizations (NGOs) supply aid that aims to support the rural development of the agricultural areas

[45] EL DAHR, Hiba. Chapitre 12. Organisations de producteurs et offre alimentaire. In : *MediTERRA, La diète méditerranéenne pour un développement régional durable.* Presses de Sciences Po (P.F.N.S.P.) : 2012. 259-277.
[46] For further information about these topics, see: BLANC, Pierre. L'agriculture au Liban : entre contraintes géopolitiques et retrait du politique. *Maghreb – Machrek,* Vol. 215, No. : 2013. 81-99.
[47] World Bank. Improving Food Security in Arab Countries. January 2009.
In: http://siteresources.worldbank.org/INTMENA/Resources/FoodSecfinal.pdf p.12

in the country of Cedars. It is also well known that the political arena in the country is an imbroglio that consists of a superposition of different power systems, legitimacy, decision making entities coexisting in a more or less peaceful manner. As a result, some of these organizations involved on the ground are not necessarily neutral and can be motivated by political or confessional purposes, balancing precariously among clientelism, corruption and actual assistance.[48]

The reproduction of communitarian schemes makes the aid inefficient and exacerbates inequalities within the population. The aid provided is highly scattered and suffers from a lack of regional coordination. In the absence of a regional policy that is thought through in an integrative and global way, the different regions benefit from a limited impact of the disordered projects.[49] Indeed, despite the substantial funding from different backers, the different programs cannot replace the coordinated action of the State. Finally, another issue linked to external aid is simply that some areas are completely neglected by these organizations, such as the Akkar region in Northern Lebanon.

Supporting another agricultural system

The so-called success of conventional agriculture masks significant negative externalities such as environmental harm, health problems or economic marginalization. Consequently, these hidden costs change the approach towards modern agricultural systems, questioning the efficiency of its production methods and bringing about alternative food production systems grouped under the large umbrella-term of 'sustainable agriculture'.

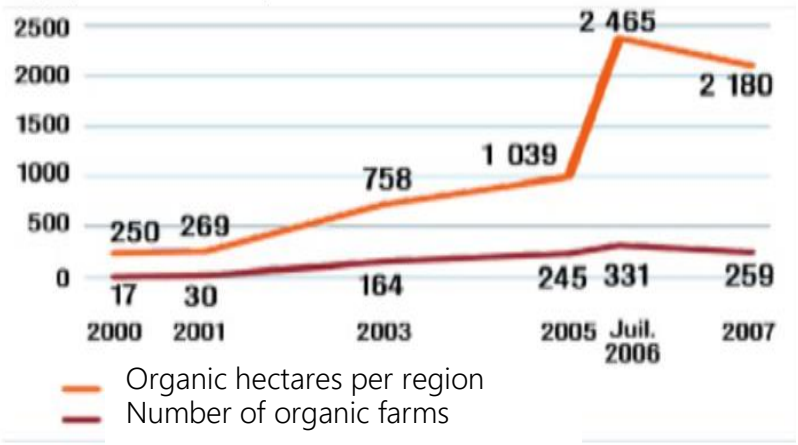
Emergence of alternative food production systems in Lebanon

Sustainable agriculture is defined as being economically viable while respecting the environment and social values. It aims at combining the concept of resilience (the ability to absorb external shocks) with the concept of persistence (the sustainment of the systems in the long run).[50]

[48] BLANC, Pierre. Développement régional et cohésion « nationale ». *Confluences Méditerranée,* Vol. 56, No. 1: 2006. P.125.
[49] BENNAFLA, Karine. Le développement au péril de la géopolitique : l'exemple de la plaine de la Békaa (Liban). *Géocarrefour*, Vol. 81, No. 4 : 2006.
[50] PRETTY, Jules. Agricultural sustainability: concepts, principles and evidence. *Phil. Trans. R. Soc. B*, No. 363: 2008. P.447.

Three key objectives are identified: the agroecological food system must ensure the availability of food (1), must develop in ways that increase the incomes of smallholders (2) and must not compromise its ability to satisfy future needs (3).[51] In this context, an organic sector emerged in Lebanon; it admittedly remains an epiphenomenon, representing only 0.87% of the total used agricultural land.[52] While there is indeed no need to jump for joy when looking at this statistic, one can still be glad to see that the agricultural organic area grew from 200 hectares and 30 farms in 2001 to 2180 hectares and 300 farms in 2008, that is to say a growth of the agricultural surface of more than 1000% (Figure 5).

Figure 5: Evolution of the organic agriculture in Lebanon



Source : CHEHAITA, Bilal/ IBRAHIM, Manale. L'agriculture au Liban: la nécessité d'une transition vers l'agriculture durable. National Defense Magazine, No. 92 : April 2015.

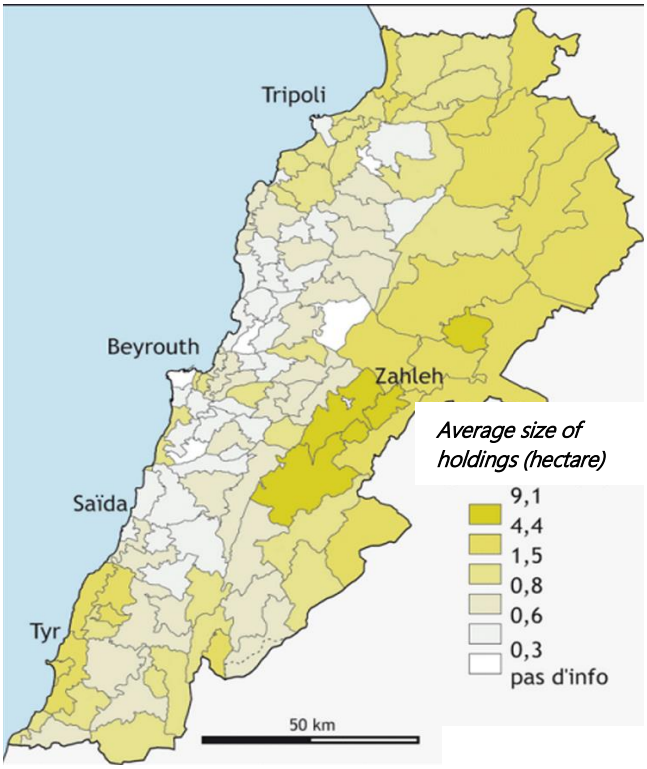
Obstacles hindering the spread of organic farming

There are of course pragmatic reasons limiting the spread of organic farming in Lebanon. Conversations which I held with conventional farmers yielded that the most important factor was the very high contamination risk. If an organic field is surrounded by conventionally produced crops, the pesticides used have a high probability of contaminating the non-conventional crops, making the organic farmer unable to obtain organic certification. Aside from this, the high investment costs (not only financially, but also in labor force, knowledge and know-how) hinder farmers from initiating a transition as they are usually highly indebted and submitted to market pressure. As a result, unless they correspond to the profile of a young farmer with an access to land and no liabilities, the opportunities are limited. It is also worth mentioning that the certification delivery occurs through the Italian organization CCPB[53] respecting European standards, which

[51] MEKOUAR, Mohamed A. Food Security and Environmental Sustainability: Grounding the Right to Food on Agroecology. *Environmental Policy and Law*, Vol. 44, No. 1-2: 2014. P.46.
[52] CHEHAITA, Bilal/ IBRAHIM, Manale. L'agriculture au Liban: la nécessité d'une transition vers l'agriculture durable. *National Defense Magazine*, No. 92 : April 2015.
[53] To have a look at their website, see: http://www.ccpb.it/en/chi-siamo/

has the monopoly on organic certification in Lebanon. The process of control and certification is therefore more costly and takes more time, leading to significantly high prices for the organic farmers in Lebanon (oscillating between 400 and 1 000 US dollars per year).[54] Finally, the communitarian fragmentation of the country reduces the opportunities for the creation of a cooperative driven by the common interests of the farmers (96% of the farmers do not belong to one)[55], which could help them in gaining bargaining powers in order to support the development of public policies in their favor. Nevertheless, to keep a positive note, let's not forget that the country's agricultural sector is organized around small holdings (no more than 5% of the farms are bigger than 4 hectares)[57] (Figure 6), which is well-adapted for a transition towards organic agriculture.[58] Moreover, the possibility of a federation of farmers should not be completely discarded as projects are emerging that advocate for the reinforcement of a farmer's identity beyond confessional belonging. This could lead to what is commonly known as a farmer's union and could bring about a framework for sustainable agriculture through their claiming of their rights. Finally, we need to remember that organic farming is becoming a trend in Lebanon (mainly for health reasons) due to a rising awareness among people, which could stimulate the development of the sector.

Figure 6: average size of holdings in Lebanon



Source: FAO. Country Pasture/Forage Resource Profiles – Lebanon.

Diversity of profiles and contradictory approaches

However, one needs to be aware that organic farming is rarely a real alternative to the market system and barely triggers an inclusive rural development as it is officially

[54] HAGE BOUTROS, Philippe. Où en est l'agriculture bio au Liban? *L'Orient le Jour,* 28 August 2014. In : https://www.lorientlejour.com/article/883060/ou-en-est-lagriculture-bio-au-liban-.html
[55] ESCWA. The agricultural Sector of Lebanon. October 2013.
In: http://www.databank.com.lb/docs/The%20Agricultural%20Sector%20of%20Lebanon.pdf
[57] FAO. Country Pasture/Forage Resource Profiles – Lebanon.
In: http://www.fao.org/ag/agp/agpc/doc/counprof/lebanon/lebanon.html#1
[58] More about the features for a conversion to organic farming, see: http://teca.fao.org/fr/read/8557

claimed. Farmers' approaches vis-à-vis sustainable agriculture are broad and can sometimes even be divergent. I could identify profiles of organic farmers through different meetings, which help to shed light on the underlying motivations and outcomes of non-conventional agriculture in Lebanon.

The most powerful, or in any case most visible actor in the organic sector in Lebanon is the organic agrifood company Biomass. Easily identified in Lebanon as it is the main actor selling organic products in specialized shops and in supermarkets, the company controls the entire production chain of organic food. Indeed, the enterprise works with farmers officially certified 'organic', buying their production and carrying out the sorting, packaging and selling of the food. The official aim of the company is to make organic products more accessible and available for the Lebanese consumer. The market rhetoric is assumed, the highlighted idea being to increase the quality and the quantity of the food while lowering costs of production. Growth perspectives are huge as this niche business is still at a low level of development and the size of the agrifood company allows it to benefit from economies of scale.

The other profile of non-conventional farmers is the small-holder. These farmers are generally young (between 25 and 35 years old), studied in Lebanon or abroad and had other jobs before turning to agriculture. They usually have an easy access to land (because it is a family property or because they have the financial resources to afford it). One can consider that they 'returned' to the land as they choose voluntarily after a professional carrier in completely different sectors to go to or to come back to the countryside. The reasons mentioned to explain this reversal are most of the time closely linked to an awareness about ecology and public health as well as a will to change the way agriculture is seen; to "make it more attractive", as one of the farmers puts it. To achieve this explicit objective, these farmers usually apply new cultural practices such as permaculture techniques: a shift from a linear to a circular system that mimics natural cycles (recycling nutrients, integrating crops and livestock, diversifying species, focusing on interactions and productivity, resource conservation, low-external-input techniques, deconstruction of dependency on fossil fuels).[59] The market logic nevertheless stays significant as the sector is economically highly risky and the financial sustainability is not

[59] DE SCHUTTER, Olivier. Agroecology and the Right to Food. Report presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49], 8 March 2011.
In: http://www.srfood.org/en/report-agroecology-and-the-right-to-food P.7-8.

guaranteed. These actors thus demonstrate a corporate pragmatism in order to ensure their economic survival.

Finally, the last type of non-conventional farmer can be identified as having almost the same profile as the small-holder but less business-oriented. This category of farmers usually use their farm as a pilot-project in order to demonstrate the efficiency and the virtue of non-conventional farming. Therefore, values and beliefs regarding ecology, inclusive and sustainable rural development and community empowerment are ubiquitous in the discourse. They officially aim at raising awareness, bringing about new agricultural practices and emancipation from the dependence towards transnational agrifood businesses. Nevertheless, they have the opportunity to do so at the cost of a dependency upon external funds to finance their projects and that allow them to escape from the market logic.

A two-tier system

A professor from the American University of Beirut (AUB) helped me understand the discrepancy between the discourse and reality. Indeed, he highlighted the fact that farmers are embedded in an economic structure which is shaping their behaviors towards an economic individualism in order to be able to face the competition of the free global market. Whether they believe in alternative agricultural approaches or not, farmers need to follow the rules of the market to be able to have a decent life. The failure of Biocoop Lubnan, a cooperative of organic farmers in which the number of participants dramatically decreased from 50 to 3 within 6 years because of the irrepressible concentration of the market due to competition illustrates this phenomenon and sheds light on the economic constraints faced by farmers. Farmers submitted to the market logic need to be competitive in order to survive economically despite the willingness they can show at first in such organization. Therefore, the arbitrage will always be done between the different dimensions instead of trying to act upon all dimensions at the same time (social and/or political and/or economical and/or ecological).

The two-tier system is perfectly illustrated by this supermarket shelf where organic products are wrapped in two layers of plastic.

This advertisement in the same supermarket sheds light on the denial of the multidimensionality of agriculture: in this case, quality cancels ecological concerns.

Pictures by the author (Beirut 2017)

As a result, organic agriculture in Lebanon, by being integrated into the classical distribution networks and the dominant financial narratives, hardly represents an alternative solution to the industrial system, nor does it push for a system change. A two-tier organic agriculture is emerging in the country. On the one hand, a corporate oriented organic production is applying a minimal respect of the norms, leading to the reproduction of the inequalities of the conventional system. On the other hand, other actors aim to a certain extent to go beyond this trend and to emancipate themselves from the conventional system. However, these actors are facing inherent contradictions between the rule of the market and their values and beliefs.

Conclusion

To conclude, the state of the agricultural sector in Lebanon does not allow the country to ensure food security. This is not to mention the other dramatic consequences linked to the agricultural system, such as health issues or climate change implications. The political situation and the strong inclination of the governments in power for neoliberal

policies does not give much hope for an imminent change. Lebanon radically needs a long-term and systemic vision for the agricultural sector in order to avoid the significant waste of its fortunate resources, to fight against the pauperization of farmers and to trigger a proper inclusive rural development in the face of imminent and dramatic climate change. If the emergence of organic agriculture in its current form barely challenges the practices of the industrial production system, it nevertheless represents the first step towards a much-needed change. The lack of State regulation is a double edged sword for this purpose. On the one hand, the absence of a legal framework is an open door to all kinds of abuses, injustices and a further degradation of the situation. For instance, as shown by a study conducted in 2014, the absence of regulatory measures brought about uncontrolled imports of genetically modified organisms (GMOs) despite the ban on imports of GM seeds (Law 778-2006) of the country.[60] The GM soybean imports involve "the risk of an accidental contamination of human food chain with GMOs products intended for animals (…)"[61]. On the other hand, the lack of regulation is also an occasion for new radical initiatives to emerge and to bring about real alternative food production systems. It is worth taking a look at and getting inspired by movements such as the Via Campesina[62], a global peasant federation, building transnational alliances in order to resist industrial agriculture and to support alternative food production systems and small farmers. Agriculture, given its potential to radically reject the neoliberal market, can (and should) be used as a political tool to trigger societal changes while being a mean to ensure food security in the country by drastically reducing the dependence vis-à-vis transnational agrifood businesses and by empowering local communities.

[60] SAKR, Joyce et al. First comprehensive GMOs testing in Lebanon: Screening, identification and quantification of GM soybean imports. *Food Control*, No. 36: 2014. 146-152.
[61] Ibid. P.151.
[62] For detailed study about the Via Campesina, see: MARTINEZ-TORRES, Maria E./ ROSSET, Peter M. La Via Campesina : the birth and evolution of a transnational social movement. *The Journal of Peasant Studies,* Vol. 37, No. 1: 2010.

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Appendix

Appendix 1: Chemical analysis on water from reservoirs, wells, rivers, sources.

Calculation from the author, based on data acquired from the Lebanese Agricultural Research Institute (LARI).

	Chemical analysis	
Region	Conformity (%)	Non-conformity (%)
Baaklin	20	80
Hasbaia	15	85
Lebaa	31	69
Tyr	29	71
Fanar	35	65
Kfarchakhna	80	20
Kesrwan	60	40
Akkar	56	46

Appendix 2: Income distribution and poverty, Lebanon, 2004/5

Source: *HAMADE, Kanj/ MALORGIO, Giulio/ MIDMORE, Peter. Contrasting Quantitative and Qualitative Approaches to Rural Development Analysis: The Case of Agricultural Intensification in Lebanon. Journal of Agriculture Economics, Vol. 66, No. 2: 2015. P.496.*

	Real per capita consumption (adjusted for regional price differences) thousand Lebanese pounds (LBP)		Headcount poverty index (% of governorate population)	
Governorate	Mean	Median	Extremely poor	All poor
Beirut	6,141	4,939	0.67	5.85
Mount Lebanon	4,321	3,506	2.18	19.19
Nabatiyeh	4,075	3,478	3.79	19.56
Bekaa	3,558	2,888	10.81	29.36
South	3,151	2,385	11.64	42.21
North	2,671	2,039	17.75	52.57
All Lebanon	3,935	3,073	7.97	28.55