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FOOD ACCESS, SAFETY AND SOVEREIGNTY

The long road to sustainable agriculture

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EDITORIAL

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Handout culture

It is bewildering to watch international humanitarian organizations donate food packages to Lebanon – the Middle East's most fertile lands. One can only wonder: What prohibits the Lebanese from investing in the richness of the land under their feet and enjoying the abundance it can produce?

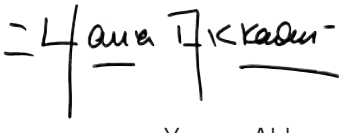
I can still remember how amazed I was watching the harvest in Marjeyoun's fields as a child, when visiting my grandparents in the summer. These valleys used to feed more than thirty-five villages located around them, and many more. Today, these same valleys are left uncultivated and neglected. Worse, the whole ecosystem that used to exist is no longer there; the cultivators, the harvesters, the flour mills, the olive presses, the colorful wholesale market and of course, the entrepreneurs who introduced innovative techniques to increase and improve the crop.

Since Lebanon's independence our top-heavy and rentier minded government system has favored the capital, as well as the hospitality, tourism and services sector over the primary industry. With agriculture having been denied attention over three successive generations, the rural to urban migration boosted the services sector and increased jobs in the city, but precious agricultural knowledge was lost. Almost nobody cared, however, because the urban demand for cheap food was filled with produce from neighboring Syria and imports from more distant lands – a structure that over time contributed to the negative balance of trade and compounded in an economic loss for Lebanon.

But even this imbalance was not something that the state cared enough about. Negligence in meeting international export standards has been exacerbated by the unhindered smuggling of drugs under cover of agricultural produce. This loss of elementary protection against abuse got a telling monetary value attached to it when Saudi Arabia banned the import of Lebanese agriculture products to its market in spring last year. The Lebanese food industry suffered an estimated $370 million market loss.

Many argue that the crisis triggered the revival of the sector. This renewed interest in the land can be considered as an awakening; one that is fueled by private initiative, promises safety and security, but threatened by greed and malpractice.

On the pages of this issue, we take a deep dive into the good, the bad, and the vast spectrum of opportunity that could become of our home-grown reborn sector with the hope that one day we will reach food safety and security.



Yasser Akkaoui
Editor-in-chief

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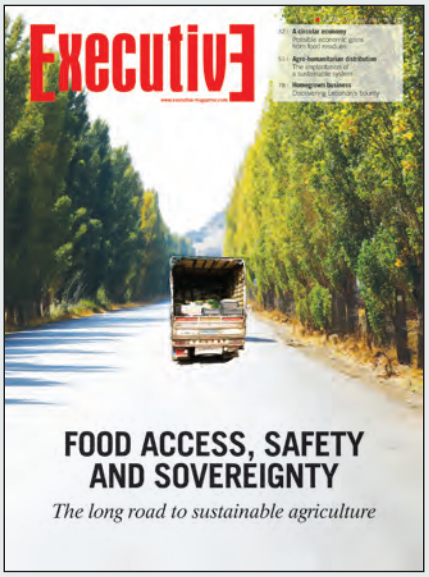

FOOD SECURITY

The challenges and strategies for Lebanon's agriculture sector

Executive

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LEADER

FOOD SECURITY

A declaration of interdependence

For a real transformation of the agro-food sector and food sovereignty

Language becomes a tool of fools when it simplifies complex systems and developments into slogans such as democracy and revolution. One blatant case of language confusion that today dogs many discussions of food security in a worldwide context, is the depiction of hunger as a sudden global crisis that needs to be tackled with grand politics and tools of international diplomacy.

The alarmist use of terms like the "global wheat crisis" and "international food crisis" runs afoul of the contradictory evidence of previous complacency over food wastage, and threats of food insecurity around the world. Moreover, the sensationalist and political grandstanding seen in the past few months contains the danger of chasing quick fixes for politically useful food insecurity.

Fixes that remove artificial barriers to exports by warring parties and throw money at balance of trade disruptions can address the moment, but will in all likelihood fade in the next year. The politically and economically hyped wheat crisis of 2022, having turned into yesteryear's narrative and exhausted national attention spans, will then distract from the need to tackle the deep-running climate, conflict, food distribution and utilization challenges which are entwined with the coming winter's predicted famine in parts of Somalia. And that is without considering the persistent problems in equitable production of food in a world that is, according to United Nations' (UN) projections, heading from being 8 billion strong at the end of this year towards a global population of 9 billion around 2037.

On a smaller scale, this dilemma of juxtaposed, unresolved, systemic problems and overemphasized temporary factors plays out as its own drama in Lebanon. When compared to fears over the availability of food, which appeared to have been aggravated by sudden new barriers to the importing of Ukrainian and Russian wheat (including speculative price peaks that railed global commodity food markets during this summer) and by the loss of the silos at Beirut port, the politics behind the domestic social safety net design, and the depreciation of the Lebanese pound, continue to be the major driver of food insecurity in Lebanon. These problems have been ignored either deliberately or incompetently but, in any case, recklessly.

Lebanon is a tiny but fertile country. The incongruence between historic reality and inflated problems of food insecurity today is another, more serious contradiction of note. Tiny countries can have huge problems in comparison to their demographic or geographic scale. But as long as they are properly run, tiny countries are good at developing solutions for their own problems.

Taking Lebanon as a system and man-made paradigm rather than a territory, this polity is equipped, or one can say cursed, with a governance system of questionable provenance. Today, the Lebanese governance system is rooted in an imperially and colonially malformed past, and in recent decades has deteriorated into a discordant anti-system of state organization.

Territorial reach is an important component to land and sea-based food production, however. Lebanon is an intriguing case of systemic behavior, but still a very small country. It is the 37th smallest among almost 200 countries, not counting unresolved or partly autonomous territories. Both aspects, the systemic and territorial one, have consequences for national food security.

When engaging in as much international discourse about food security as affected stakeholders, like how the public in Lebanon and Executive are doing this year, profound changes of food systems in national economies and a targeting of global food sovereignty have to be put on an emergency action agenda which also includes the management of increas-

ing intra-national and international conflicts, as well as inequality and mitigation of climate risks.

Food, in this context, is both a crucial base for human sustenance and perhaps the most powerful agent of constructive transition available to mankind. But this transformational power has to be understood and used without ideological partisanship, beginning from the terminology attached to food and agriculture.

On a conceptual level, it defies conventional wisdom to speak of the revolution of anything in an agricultural context. It is a misnomer, but also seems unhelpful for thinking about the path of future agricultural transitions when past centuries' ideological framing of scientific research have labeled long periods of gradual innovation and transitional development in the system of agriculture as "revolutions", even though they are changes that are organic in every sense of the word. Consider the "first agricultural revolution" with its 20th century host of associated theories, the so-called Arab and British agricultural revolutions, or the last century's "green revolution" that occurred under the increasing grip of corporatized cultivation of soil, and the degradation of diverse rural cultures of soil-based tribes and families.

Interacting with the seasons, the land, and nature's inputs, plus investing the human labor needed for agricultural productiveness, is a fundamentally conservative act – in the sense of 'conservare', the Latin verb meaning "to keep safe" or "to preserve". Revolution expresses the very different intention of rolling back a status quo perceived as failed; it is the act of turning everything and nothing around, whatever the cost and violence that comes with it.

FOOD SOVEREIGNTY

For the purpose of a better discussion on the integrated future of agriculture, in a global system of human physical and mental sustenance on the level of a species that has created the Anthropocene, let us discuss what might be called planet-wide food sovereignty; the world-encompassing achievement of food security with all that it entails, implemented by a global network of interdependent national food systems.

Then let us discuss democratic food sovereignty. Drawing on definitions devised earlier in this century, this refers to the right of peoples to define their own food system and agriculture: the system of producing and making accessible culturally rooted and ethically accepted food on the level of a clearly defined national or sub-national realm, while maintaining respect for nature through the use of ecologically and economically sound, sustainable methods.

Executive calls on retailers, especially leading supermarket chains, to promote domestically produced processed foodstuffs

Thinking of the more than six million people who have made their home in this country, let us propose that Lebanon needs a micro-to-macro "agroconservalution" aimed at food sovereignty. This is to declare that a solution in agriculture and in food system construction on the famously fertile Lebanese soil would never be a revolution, but more of an incremental series of interconnected innovations and system building.

The neologism proposed here is not seeking to enter the dictionary as much as it wants to be a reminder for the harmonization of conservation ("conserva") and revolution ("lution"), or actually innovation in a holistic management of everything, "agro".

A Lebanese food security solution would be microeconomic; from an entrepreneurial ground-up sense, with digitally advanced startups and initiatives that are found along the entire food value chain, from inputs to production, to testing, packaging, branding, marketing, distribution and equitable social access. For better micro interaction with the supply side, Executive calls to elevate building awareness for agro-food entrepreneurship among the public.

Even more importantly, we ask for higher awareness and attention from economic and policy decision makers. From the rise of freekeh as a Lebanese superfood, to the potential for biomass utilization, there are many emerging subsectors of the agro-economy which warrant such attention.

In suggesting an effort among the private sector for improving awareness and market access, Executive calls on retailers, especially leading supermarket chains, to promote domestically produced processed foodstuffs, and donate prominent shelf space and awareness campaigns to small local producers and quality food processing startups.

The new food security solution has to be macroeconomic in equal measure. This could be achieved, if the state, as partners in a new real economic focus, was achieving regulatory and supervisory diligence, and finally providing strategic support to food security by governmental entities that work in a synergistic concert.

Instead of asking for another internationally funded and conducted study, or presenting projects with high corruption risk, or devising the third or fourth iteration of an agricultural strategy that is overflowing in the right words and underwhelming in presenting budgetary possibilities and all numerical assessments, a homegrown consolidated environmental, cultural, agro-industrial, and agricultural strategy is in order.

LEADER

The insufficiency of public systems underlying food safety and upholding food security targets was evidenced this autumn by the cholera outbreak. It made for an epidemic that was avoidable, considering cases were heaviest among population groups who could least protect themselves by using simple means of hygiene and uncontaminated water because they cannot access such luxuries.

To sum up the idea of "agroconservalution", micro and macro solutions such as above would be constituent components of global food sovereignty in alignment with the understanding that nations' contributions to international peace are not achievable by striving for preeminence with economic, military or political means, but by seeking to contribute to global self-sufficiency at a time of new challenges of planetary proportions.

On the national scale of Lebanon, a new key performance indicator of "agro-conserva-lution" would be agro; in the sense of comprising agricultural, agro-industrial, and food industry stakeholders in hospitality, delivery, and humanitarian services. It would conserve; rebuild and improve soil and social and economic structures of an historic small-holder rural system and the famed Lebanese culinary tradition and healthy diet. It would change; radically from the roots up – innovate primary, secondary, tertiary, and vocational agro-sector education, rural inclusiveness, access to finance, social safety, interaction with markets, and most of all the legislative approach and real-economy mindset of the state.

> Today, the Lebanese governance system is rooted in an imperially and colonially malformed past

The change and innovation trajectory from the short term onward would include continued expansion and diversification into specialty production segments from wine and goat's cheese, to healthier alcoholic beverages and high-in-demand organic fruit and vegetable preserves, to herb and spice mixes. It would be a fitting dream for a country that has nothing to lose but the abysmal dysfunctionalities of its previous governance and economic systems.

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SPECIAL REPORT

FOOD SECURITY

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By Thomas Schellen

FOOD MADE IN LEBANON

Buzzing with diversity and contradictions

Seeking out the voices of agriculture means listening to the songs of a quiet land

The village of Kfarmishki in the western Bekaa hugs a hillside. Its apparent central intersection, whose main features include a roadside bench and a resilient donkey, takes three seconds to traverse and less to fade into memory.

Kfarmishki is not exciting in the picture-book sense of some other Lebanese villages. If there were such a thing as, however staid, a national competition for village beautification (the kind that once upon a time motivated villagers around Western Europe to embark on gardening and decorating frenzies), a crafty public relations copywriter might call Kfarmishki the jewel of the Bekaa or the pearl on the hill. They would be lying – except from the angle that it is an average village in a land where villages have deep-rooted, and thus intriguing, identities and communal histories.

There are a few routes for getting to Kfarmishki from Beirut or any of the coastal traffic centers. Yet, whatever route and mode of land transport one selects, getting to this village will require a couple

of hours travel on bad roads and there is no direct public transport link from pretty much anywhere. Also in this regard, it is a typical Lebanese village in the deep hinterland. But if the copywriter were to attach one or other glorifying epithet to this remote aggregation of humanity, our hypothesized PR wordsmith would actually be speaking truth when portraying Kfarmishki as a village that is looking for a sustainable future, and doing so with foreign financial support – in an initiative that is developing up from the vine-roots (the grass-roots allegory seems misaligned with the agricultural geography in the area) because of its enterprising denizens.

As an expression of their entrepreneurial vigor and after a two-year interruption, the Kfarmishkites (or Kfarmishkians?) organized their 4th Mouneh and Grape Festival in September 2022. The festival turns the dusty square in front of its church into a stage for young dabkeh performers, and the adjacent street into a lively market with two rows of booths displaying local products; from fresh organic fruits to a large range of "mouneh" or preserves/pickles, as well as wine ("Domaine Pierre") and arak. The occasion of the festival also makes for an affordable opportunity (exceptionally on this weekend, there is a dedicated bus service from Beirut) to get a first-hand feel for the economic mood among the farming community.

This year, the harvest festival has seen some weakening in the number of urban visitors, Wissam El Khoury, head of the local cooperative, tells Executive. "There have been difficulties in organizing the festival because everything has changed from 2019 until today. The crisis has affected Kfarmishki and all farmers are affected by it," he acknowledges.

The agriculturalists struggle to succeed against the same pressures facing the urban majority of Lebanon, like the loss of subsidies, inflation, depreciation, and shrinking purchasing power. Yet, when compared to Beirut and the other large cities, Khoury nonetheless sees a better proposition for sustenance where he is. In his view, agriculture is less vulnerable to the economic and political situation than other sectors. "In Beirut, it is more difficult and so we prefer to live in Kfarmishki. Farmers are resorting to plant their produce and meet their own [food] needs from this. It is somehow easier than existing in the city," he elaborates in a mixture of Arabic and English, with the active translation support of his daughter.

According to Khoury, a group of farmers set up the village co-op in 2013 and since then developed a local support farming infrastructure that included trucks and other equipment, which were acquired with the help of Lebanese and international NGOs. The co-op has 25 members among Kfarmishki's agriculturalists, of whom there are about 100 in total.

Photovoltaic renewable energy capacity was installed on the roof of the village school well before the collapse of electricity subsidies, as well as in the co-op's most recent initiative, a central mouneh kitchen, which was implemented this year. However, the open-air irrigation water dugout reservoirs down the hill are mostly empty this September, because of high fuel costs that impede the transportation of water, Khoury says. Other infrastructure needs, such as cold storage facilities, require costly transportation, while the farmers' markets in Beirut are too far away to access regularly. A platform for marketing the village's agro-food outputs is desirable and being thought about, but absent.

Within the boundaries of their rural circumstances, the farmers have adopted an ambidextrous mix of practicing subsistence and export orientation. "We plant all kinds of fruits and greens and vegetables on our lands to secure our existence. We use only pesticides that are certified and permitted when shipping products to the world and the co-op has adopted the [European] Global G.A.P. [farm management] standards. We export all our grapes. Our biggest challenge is in developing our competitive advantage versus countries that produce the same [fruits and vegetables] as we do," Khoury says.

A group of farmers set up the village co-op in 2013 and developed a local support farming infrastructure

Hearing a co-op leader talk about competitive advantages and learning that international standards are known and professed to be at the level of Lebanese village farming should not surprise in the least. Assuming agriculturalists to be ignorant, despite their position as economic actors in an ever more interconnected and competitive world would be an insult to the intelligence and development of rural communities anywhere, and certainly in Lebanon with its high-middle-income background and predilection for innovation and advancement.

Leaving Kfarmishki and crossing the Bekaa plains on the return trip to Beirut, images of ripening crops in field after field, interspersed with fields where groups of seasonal workers are engaged in harvests, reinforce the impression of a highly fertile plateau that is a base for agriculture and sustainable agro-industry. Lebanon, despite its high degree of urbanization and an estimated rural population

of about 11 percent, is a country of many villages where economic hardships have assuredly intensified due to three crisis years but where solutions, evidenced most visibly in new renewable energy installations, are in process.

Journeying past Bekaa villages is finally a reminder that clusters of people have been living on these fertile lands since Neolithic times and those blessed with living here have regularly been producing food far in excess of their subsistence needs. In comparison to the norms of the period, high agricultural productivity has been the prevailing reality already when Josephus, the Jerusalem based, Roman-era historian of the first century AD, saw "not a parcel of waste land" in his military forays into the "Galilee" region between Mount Carmel and the Litani river.

Some commentators on Josephus' exuberant descriptions have supposed exaggeration in his praise of a Levantine territory that is partly in modern Lebanon, as one being "everywhere so rich in soil and pasturage and produces such variety of trees, that even the most indolent are tempted by these facilities to devote themselves to agriculture." However, save for man-made food catastrophes (most famously the Mount Lebanon famine in World War I), during the past 20 centuries since the scribe of the Roman empire reported from Galilee, territories in Palestine and Lebanon have to this day been absent from the long list of famines around the world. Intense and extensive life-threatening disruptions of this agro-system's productivity have been few and entwined with human failures to let each other live.

Wissam el-Khoury, the head of Kfarmishki's local farmers cooperative

PEELING AWAY MISPERCEPTIONS

The Levant was noted as one of the original interactive habitats of wheat and human by five American University of Beirut researchers in a 2019 paper: "Cereal culture, including cultivated strains of wheat and barley, originated in the Levant and expanded northward... into central Europe in the 6th millenium BC." But even without agonizing over the irony, it is doubly counter-intuitive to think that this thriving landscape, albeit entangled into a negative cycle of diminishing water, energy and biodiversity resources, would fall into a severe wheat production crisis in the third decade of the 21st century.

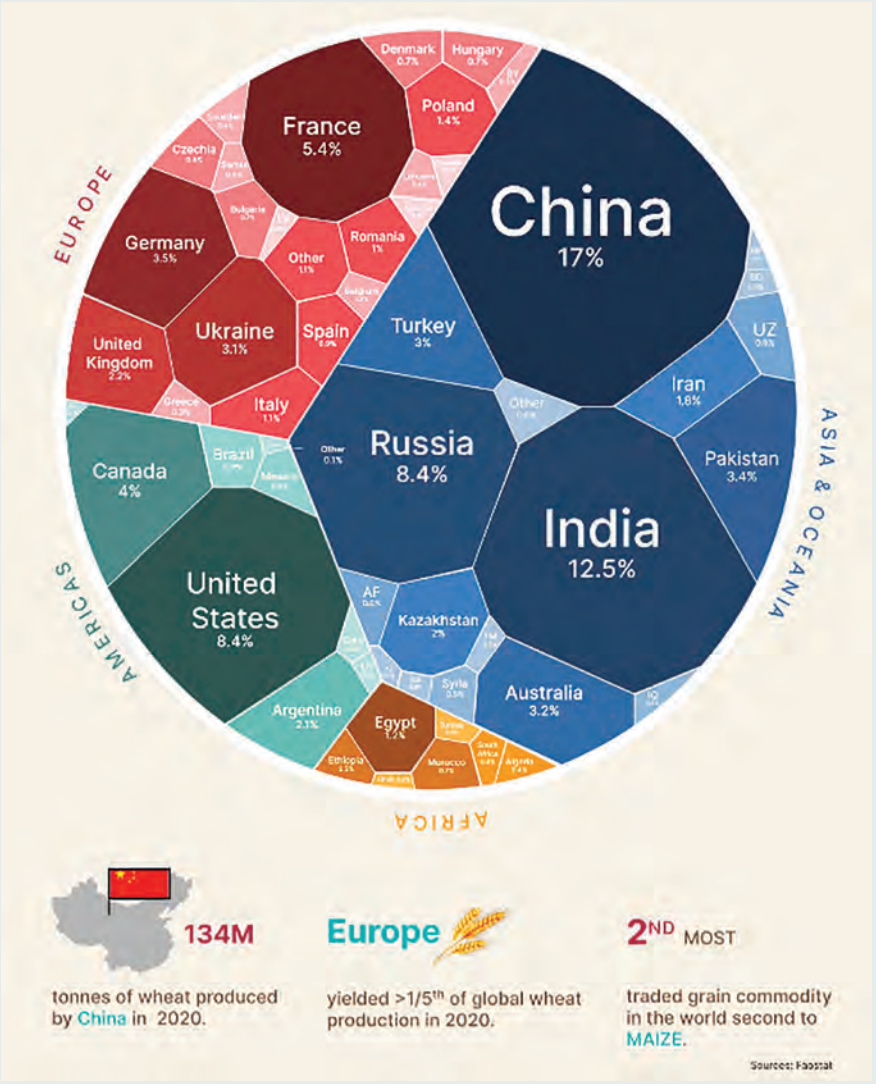
> Territories in Palestine and Lebanon have to this day been absent from the long list of famines around the world

It also comes at a time when global wheat cultivation has been producing yields which have fluctuated in annual and multi-year terms, but for half a century have moved along an upward trend line to unprecedented magnitudes.

Not only run against the historical evidence of the agricultural fecundity of Lebanese lands, and against this year's harvest season's evidence of the Lebanese productivity having survived the most intense crisis years that any rational economists could have imagined, such assumptions generate an obligation to check the facts and weed out the exaggerated allegations related to food in Lebanon, and the general size of the food insecurity threat.

The community of nations officially adopted the goal to eradicate acute food insecurity and hunger along with poverty in 2000 with the establishment of the United Nations Millennium Declaration. When 15 years later, the Millenium Development Goals were expanded into the Sustainable Development Goals (SDGs) the target of "zero hunger" became the second of the 17 SDGs. Against a background of progress towards achieving SDG 1, eradication of poverty, and 2, zero hunger, in the 2000s and much of the 2010s, two things must be recognized: firstly, progress towards SDG 2, according to the UN, has been slipping away since 2015; secondly, only after Russia's invasion

GLOBAL PRODUCTION OF WHEAT (FROM 2000-2020)



Source: Visualcapitalist.

In Khoury's view, agriculture is less vulnerable to the economic and political situation than other sectors

of Ukraine did the topic of food security come to dominate the global debate.

One cannot ignore that many speeches and passionate declarations about the risk or even certain coming of a "global food crisis" during the past eight months have been driven by politics. The sudden rise of "panicky headlines" about a global wheat crisis was not based solely on the facts, as noted by Sarah Taber, a crop scientist and contributor to US publication Foreign Policy. She wrote that a regional supply crunch of wheat was clearly present for countries that source wheat from Eastern Europe (such as Lebanon and other Middle East and North Africa countries), but argued that this was not the same as a global wheat crisis. According to her, record crops in Australia, India and elsewhere were indicating that globally, "there was enough to feed everyone" – but only if the transport and distribution questions are addressed.

And yet, the evidence suggests that the politici-

zation of the wheat issue immediately after the Russian invasion of Ukraine has been more than a layer of propaganda warfare. The slinging of mutual accusations of "weaponization of food" by parties with direct and indirect stakes in the Ukraine conflict – the latter including the US and the European Union and a host of international organizations – has drawn the attention of leaders, global financial organizations (the IMF created a food shock window), and influencers to a food crisis that would otherwise not have received the attention that it needs. The eruption of the Ukraine conflict into a regional supply crunch of wheat and edible oils is a wake-up call in alerting the world to the return of hunger on an epidemic and devastating level.

In its latest report on the state of food security and nutrition, the danger of hunger has been quantified by the UN Food and Agricultural Organization (FAO) as afflicting nearly 830 million people in 2021. On the occasion of World Food Day this October, the UN World Food Program (WFP) said food crises have this year been escalating in vulnerable countries such as Sri Lanka and Pakistan. Moreover, the organization announced that it was "holding back famine" in five countries: Afghanistan, Ethiopia, Somalia, South Sudan and Yemen. "Things can and will get worse unless there is a large-scale and coordinated effort to address the root causes of this crisis," warned WFP Executive Director David Beasley.

■ The global rise in food insecurity is also a local wake-up call

In a search to gain an accurate perspective by starting from the most afflicted area, the acute food insecurity and danger of famine in parts of Somalia stands out through its horrendous dimension. Estimates read that 6.7 million people are suffering acute food insecurity, and 300,000 lives will be at risk of starvation at the end of 2022, among a population of 16 million. Recent analyses by various scientists, including social scientists, say that the current crisis marks the third famine event in Somalia since 1990. Analyses of Somalia's large-scale famines of 1991 and 2011/12 stipulate that long periods of drought underlying the catastrophes are linked to long-standing climate phenomena in the past, and to climate change today.

In a comparison of numbers of victims of starvation in Somalia and Ethiopia in the past decade, other academic researchers have demonstrated the importance of state capacity and governance in keeping famine at bay. Scientists noted the absence of mitigating factors in Somalia, where a quarter of a million people starved in 2011/12, versus Ethiopia, where very few fatalities occurred in a severe drought in 2015. The factors that kept famine in Ethiopia in check included the presence of improved capacity by the state to deliver services and unencumbered use of international aid.

This is a clarion call to tell all of humankind that the ethos of conflict resolution must prevail against the increasing social and political rifts between and within nations, while diplomacy has to be intensified and international solidarity cannot stop. As the highly divergent food crisis outcomes in countries at the Horn of Africa in the 2010s have shown, provisions of international aid, but also inter-communal and intra-communal support networks of expatriates and families contribute greatly to lowering levels of acute food insecurity and famine. Extension of aid to tribes and ethnic groups that suffer from being ostracized serves food insecurity mitigation needs. Control of unrest and mitigation of underlying factors such as racial hatred and social exclusion of ethnic groups are vital in averting famines, as they can lead to, at least temporary, cessation of internal warfare by militias and a reduction in conflict exposures of aid workers.

TACKLING THE OBSTACLES

The facts (scientifically confirmed) of agricultural capacity and production on the ground are that the world is producing more food than ever

before. The moral consensus view of academic and activist food security advocates is that in 2022, no one should suffer from lack of food, let alone extreme starvation. The issues entwined with the politics and economics of food in the current global setting should leave no mind in doubt that food crises, up to the threats of acute food insecurity and famine – the difference between the two being contained in degrees of severity of malnutrition and the mortality rates in an affected population – are correlated with issues of human behavior, such as war, wastage, and an overweight of anonymized financial greed.

What does this imply for the food crisis of the tiny country of Lebanon? Like it is for all countries, the global rise in food insecurity is also a local wake-up call. This year's intense declarations of unfolding food security emergencies, whether in drought-hit countries or countries inundated by floods, require looking at the problems of equitable access to food and agro-industry products as the unsolved catastrophe at the core of food insecurity. And so it is in Lebanon. "The four main pillars of food security are food safety, and the availability, accessibility, and utilization of food. Among these four pillars, accessibility relates less to producers but is found on the consumer side, where it is threatened," Marc Bou Zeidan, a microbiologist and manager of the Qoot food innovation cluster, tells Executive.

According to him, the economic crisis has impacted food security of the Lebanese people in a tangled way. The local market could not provide hard-currency income to producers and both farmers and agro-industrialists were inextricably drawn to export markets. As these markets are highly demanding in terms of quality, reliability, branding and regulation, smart agriculturalists and agro-industrialists secured certifications and focused on quality for exports. "The crisis has shifted the interest of producers towards exports and neglect of the local market. [This shift] is very important for the sustainability [of producers] but very bad for food security in the local context. We are exporting all that is good and all that remains here in Lebanon is what is of lower quality. Although I don't want to be rude [in saying so], what is left here in Lebanon is risky in terms of food safety. This is a very dangerous result of the shift towards exports."

The contradiction between the need to export for economic sustainability and the need to serve the population in the country with safe and healthy

foodstuffs, points to the importance of strategies that develop the Lebanese agro-sector from within, under the inclusion of international funding and advisory partners, rather than being imposed from an administrative distance or, as seen early in the 2000s, imported as wholesale concepts that get stuck in the traps of corrupt bureaucracies and centers of political power.

According to the food security experts and agricultural stakeholders met by Executive, markets and multinational corporations in the agro-industry must not be shunned but a balance of food sovereignty and food security in an overall framework of food interdependence needs to be targeted. Opportunities based on certification, compliance with quality standards such as Global G.A.P., grassroots collaboration among agro-sector members – of which the Qoot cluster, according to Bou Zeidan, has seen amazing examples in its five years of operations to date – and smart use of natural food export windows, abound. Doing all this while applying partnership strategies that are constructed from the bottom-up and are inclusive of top-down and administrative and regulatory buy-in, will allow the production of an agro-food earnings pie which will be worth multiples of the annual food export earning currently achieved, and that will boost food security for the Lebanese.

> "We are exporting all that is good and all that remains here is what is of lower quality."

By Rouba Bou Khzam

LEBANON'S FOOD SECURITY IN CRISIS-MODE

From mismanagement to education and inflation, years of inefficiency has left the sector in a pitiful state

The latest chapter of Lebanon's compounded and overlapping disasters has emerged in the shape of a bleak and multifaceted food crisis. As if a hard-hitting dose of COVID-19, the Beirut port explosion of 2020, and a crashing economy was not enough, this year, world-wide economies were shaken by Russia's war in Ukraine which triggered unprecedented global food security fears.

For Lebanon, the crisis has exacerbated social hardships among an increasingly poor nation, which has disproportionately impacted poor and vulnerable households, and reinforced inequality. Every week, more and more families are resorting to cut staple items from their shopping lists as food inflation rates rise uncontrollably, while politicians idly stand by. Lebanon's food sector, insecure prior to the economic crisis, now has all its weaknesses exposed.

Yet the war in Ukraine and its global ramifications are not only to blame. There are multiple factors which contribute to food insecurity in Lebanon; some have been born out of the crisis, while others have plagued the sector for years, like neglect of agricultural investment, local and regional political instability, and financial mismanagement.

FOOD AVAILABILITY

Lebanon's position as a net importer of food has been uncovered as a major vulnerability in light of the global disrupted grain supply chain, which is aggravating existing difficulties in maintaining adequate stocks. In addition, as the Lebanese pound has collapsed, the Central Bank's foreign exchange reserves are dwindling, and consequently its ability to subsidize essential foodstuffs.

The Ukraine-Russia conflict continues to exert pressure on international wheat prices and threaten future harvests for the two fighting countries, both renowned for their grain output. This is particularly concerning for the Middle East, where many countries rely on Ukrainian and Russian wheat to feed societies reliant on bread as a daily food. In Lebanon, around 78 percent of imported wheat comes from the two countries.

Prior to this year's global wheat disruption, Lebanon's food accessibility had already dealt a major blow in 2020, when the country's main grain silos were blown apart in the huge port blast in Beirut. With a capacity to store 120,000 tons of grain to meet a consumption rate of 50,000 tons a month, the disaster was a major hit to the core of the country's food security.

Meanwhile, Lebanon's oligopolistic food importers, who hold control over prices and stocks, have worked to the detriment of supplies. Supermarket shelves filled with an array of American and European brands have been emptied and instead stocked with Turkish and Syrian products, as suppliers struggle to access US dollars.

Despite rich soil and an apt Mediterranean climate, decades of poorly managed economic affairs led to inefficient use of arable lands. Cultivated land represents less than 25 percent of the country's total landmass, according to a country profile report on Lebanon from United Nation's Food and Agriculture Organization. Land ownership is also highly unequal and fragmented. The agricultural sector itself is dogged by poor financial access, partly from the financial crisis and also from unsophisticated production processes. In addition to the high cost of production, it leads to a weaker competitiveness for Lebanese products.

FOOD ACCESS

Several international reports have proven the impact of the economic crisis on food security in Lebanon. Recently, the World Bank published findings showcasing Lebanon's food inflation rate: the second highest nominal inflation rate in food prices globally during the first eight months of 2022. This was also matched by a report from International Information, a Beirut-based research and consultancy firm, which detailed a 500 percent rise in the cost of living from the beginning of 2020 until the end of August 2022, as the prices of imported goods increased by more than the rise in the exchange rate of the lira to the dollar, as well as the price of locally produced goods.

On a day-to-day level, the deterioration of food security has forced a change in local eating habits and citizen's health. Speaking to Executive, Maha Hoteit, member of the National Scientific Committee for Food Safety of the Ministry of Public Health and professor at the Lebanese University, explains that over half the Lebanese population suffer from poor dietary diversity and are eating less than two meals a day.

Food security requires "food availability, food access, proper food utilization, and stability or consistency in these components," she says. "The biggest challenge today is not in securing food commodities, but in the ability of citizens to pay for them, especially after the dollar exchange rate approached LL40,000 and the purchasing power of citizens decreased further." She also mentioned that people have been forced to abandon meat and dairy foods since prices jumped, creating potential health vulnerabilities and deficiencies in essential nutrients.

"Oftentimes, people are quitting breakfast to eat mankousheh or a falafel sandwich for lunch, and in the evening, they eat sweets to withstand hunger to the next day," Hoteit says, before adding that such a diet can harm a child's mental and physical development. Hoteit says the quality of food has been negatively affected by the country's economic collapse, while underlying poor standards have exacerbated it: "Poor packaging and preservation of foods, especially proper cooling, has caused problems in the digestive system of some, in addition to an increase in poisoning rates, and its symptoms including vomiting, [and] diarrhoea."

Over the past twelve months, a surge in the number of food poisoning cases was reported widely in local media, as the hot temperatures of the summer combined with power outages have impacted refrigeration and food hygiene.

As for whether the focus on grains is sufficient as a substitute for other items in the diet, Hoteit answers: "Sufficient amounts of proteins that are usually consumed from fish, white and red meat can be obtained if the majority of dishes are from Lebanese cooking characterized by a mixture of ingredients, especially grains and vegetables. As for vitamins, minerals and fiber, they are all available in Lebanese dishes and cereals, thus focusing on them in the diet is more beneficial for human health without meaning that we should completely abandon meat, chicken and fish in our diet."

A recent study by the American University of Beirut also demonstrated the changing nature of local food habits. Some 91 percent of households (among a survey of 931) have had to reduce the quantity of non-staple foods that they buy, and 33 percent of adults were skipping meals more than once a week.

NEED FOR IMMEDIATE ACTION

Perhaps the worst part of the current food insecurity cycle is that it was predictable. For decades, the international community has warned that without a real long-term food and nutrition security strategy, Lebanon's next food crisis would be deeper and existentially damaging.

Despite the urgency of the situation, the government is still struggling to pass a comprehensive economic recovery plan which could mitigate parts of the crisis. The paralysis has forced the mobilization of civil society and the extensive Lebanese diaspora to meet the growing desperation. Multiple grass-roots organizations, like Food Blessed or Matbakh el Balad, have since emerged and their thousands of volunteers are delivering food packages and warm meals across the country. But this remains a glaringly short-term emergency solution, and does not address root causes, which lie in the hands of the government.

> Every week, more and more families are resorting to cut staple items from their shopping lists

In August, the United States announced a $29.5 million humanitarian aid package to Lebanon, which will target vulnerable populations in light of rising food insecurity. Within the package, $14.5 million will support vegetable and grain farmers with seed and seedling supplies to help local food production, among other projects for local producers.

Lebanon has the highest proportion of arable land per capita in the Arab World, yet its agricultural sector is neglected. Nonetheless, the agricultural sector alone is no miracle cure. Only the adoption of a broader set of economic reforms will help restore confidence in the country and promote financial stability, thus prompting the international community to step up their assistance. Essentially, the world will help Lebanon when Lebanon helps itself.

By Rouba Bou Khzam

FALLING FOOD SAFETY STANDARDS HAVE LEFT A POPULATION SICK

The socio-economic crisis has seeped into all parts of daily life

Access to sufficient quantities of safe and nutritious food is a basic right, yet in Lebanon, such access can no longer be guaranteed. The three-year old economic crisis, which quickly expanded into a socio-economic crisis, has radically changed the lives of citizens up and down the country. Priorities have switched: how does a mother choose whether to buy meat for her children or sanitary pads for herself? Filling the car with gasoline, or buying medicine? Such ever-present dilemmas have forced many to resort to purchasing cheaper items, which is leading to a higher risk to consumer health and safety.

In Lebanon, slipping food safety standards is a by-product from a range of external deteriorations: widespread electricity shortages, depreciation of the Lebanese pound, the dwindling state subsidy, and so on. As food inflation has reached among the highest in the world, consumers have turned to cheaper items where safety standards cannot be guaranteed. The electricity blackouts have posed a major challenge for shop owners and restaurateurs, who have been forced to chuck out huge quantities of spoiled meat and dairy produce, together losing revenues and customers.

Lebanon's reliance on imports for 80 percent of its foodstuffs has been exposed during the last three years of economic downturn. The dependence has been to the detriment of the population, as US dollar shortages left the government scrambling to subsidize wheat, grains, oils, and other food items deemed essential. It forced a change in the food market and lower quality products have filled the shelves of shops.

FOOD QUALITY AND SAFETY STANDARDS

Agro-food engineer and food safety specialist, Sabine Chahine, tells Executive that a high-qual-

ity product conforms to local or international standards which take into account aspects such as: product components, nutritional content, prohibited and permitted substances and their percentage, external shape, color, taste, thickness, acidity, and pollutants.

She defines food safety as food free from contamination risks which might lead to food poisoning, a malady many of Lebanon's residents will have found themselves familiar with over the past twelve months. Possible risks range from biological (germs), chemical (sediments, agricultural pesticides, and antibiotics), physical (hair), allergic risks (wheat), and food-borne diseases, which are especially dangerous to people with compromised immunity, like the elderly or the very young, pregnant people, those chronically ill, or those undergoing chemotherapy treatment.

ABSENT CHECKS

The economic crisis has led to long-term repercussions and successive crises across sectors. One of the more tangible aspects has been the rise in cases of food poisoning, a direct consequence of the breaking down of basic services like electricity and water. Daily blackouts mean food in fridges and freezers cannot be kept at required temperatures, which has caused a surge in bacteria growth and sickness, though it is difficult to gauge the precise amount of cases aside from anecdotal evidence, as the Ministry of Public Health does not publish regular figures.

"Nowadays, controlling the quality and safety of products in the Lebanese market is no longer as effective as before," Chahine says, explaining that citizens are no longer able to afford products from reputed international brands with ensured safety standards.

"We are witnessing an increase in cases of diarrhea that usually appear in the summer season as a result of the high temperature, but this increase is due today to the power outage that leads to the multiplication of bacteria in foods. As we know, food must be stored and preserved at temperatures below 5 degrees, especially cheese, dairy, meat, raw chicken and eggs... These foods, if they carry bacteria and are placed at normal room temperature, will lead to the proliferation of bacteria and cause food poisoning."

Chahine also notes that salmonella bacteria are most commonly found in foods in Lebanon, as well as other types of bacteria spread through contaminated surfaces. "The roads are full of waste, which causes a gathering of rats, flies and mice, which carry germs with them and distribute them wherever they are," Chahine says.

The economic crisis and subsequent deterioration of living standards has caused a rise in public health concerns, resulting from slacking food safety standards among the responsible government departments. Elie Bteich, chief executive officer of Byscon Consultancy, a local firm specializing in all food safety, quality, health and environment management systems, notes that an absence of proper supervision and safety checks has led to more people buying "corrupt" materials for their lower price. "The spread of spoiled meat is the result of poor preservation or the presence of bacteria in it, which is usually sold at low prices after some traders refuse to dispose of it and seek to resell it," Bteich says.

> Daily blackouts mean food in fridges and freezers cannot be kept at required temperatures

Some meat and dairy items are entering Lebanon in an illegal manner, according to Bteich, and as such are averting necessary quality control checks. "[The food is] either not fit for eating or spoiled, as a result of being transported in unrefrigerated cars and in very bad conditions, or in warehouses that lack electric current and that do not meet the safety requirements," he says.

Earlier this year, the Bekaa Health Department was forced to shut down four butchers after 50 residents were struck with food poisoning from eating raw meat, and subsequent testing found four separate butchers were selling contaminated meat.

Bteich recommends increasing consumer awareness through training seminars

Bteich notes that among Lebanon's dairy and cheese factories, while there are "very reliable and respectable factories," there are also some which are "not subject to any supervision and the quality of their products cannot be ascertained."

CAREFUL CONSUMERS

Over the last year, many Lebanese have been discovering different ways to avoid food poisoning; buying items and cooking the same day, going vegan or simply choosing to purchase cupboard items which do not rely on refrigeration. Sabine explains that "food remains edible for four hours after a power outage, but after this period some foods spoil quickly, and they must be disposed of immediately, such as raw foods like chicken, meat and fish."

She also says that consumers must be aware of the meat's color, smell and texture. "It must not have a sticky substance on it because this means that it has begun to spoil. As for chicken, when pressing on it, there should be no traces of fingers on it." Any animal-based products, like dairy and eggs, Chahine also advises to take similar precautions with, like buying in small quantities at a time.

Looking at the larger picture, changing mentalities by improving education should also be included as a method to improve food safety among the population. Bteich recommends increasing consumer awareness through training seminars, or even television campaigns. However, he says that on a government level "a full plan from laws including importation, to distribution chains, storage and food handling should be implemented on all levels."

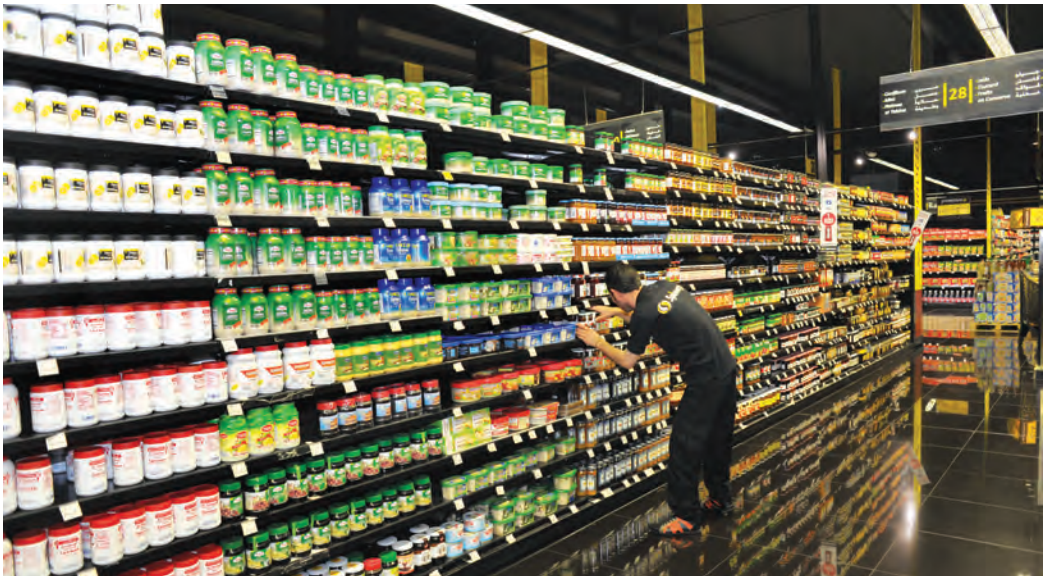
MEASURES TAKEN

The growing absence of health and safety standards among Lebanon's food is an ongoing challenge for society and the state, and has already come at a great cost to the wellbeing of citizens, just at a time when the health sector is juggling its own shortages and financial woes. Earlier this year, the Ministry of Public Health launched an action plan for food safety, following a tumultuous previous summer of food-related sickness. Caretaker Prime Minister Najib Mikati called the issue a "top priority" for the reputation of the industry and for the safety of citizens. The ministry's absence of a central laboratory, which the Health Minister called "one of the most important controls for the issue of food quality and medicine," will remain one of the major hindrances to safer standards for residents.

Like many of Lebanon's other sectors, the support of the international community is necessary to improve standards and services through training and education, equipment and expertise. However, unlike many other sectors, the health of the population is dependent on the quality of the food industry, and as that quality falls, so too does the wellbeing of the individual.

By Thomas Schellen

BAD MARKET, GOOD MARKET



A few notes on markets and food security

Markets were the first places where food security was achieved in a commercial context. It can be philosophically presumed that the other conduits of prehistoric food security consisted of charitable sharing, in the context of group solidarity and religious belonging, and of the intra-familial or tribal organic sharing economy which existed millennia before idle intellectuals and ambitious wordsmiths ever coined terms like "sharing economy".

The rest of what can be said about individual subsistence living and group living in prehistoric human communities is mostly conjecture and speculation. The entire narrative of the "agrarian revolution" is endlessly suspect in view of recent archaeological discoveries and anthropological theses. The relationship between markets and food security has been acknowledged in research as a component of societal existence whereby the former is empowering the latter, by providing availability of food and making food accessible on the terms of the market. In this regard, the principle of competition and the need for market actors to woo customers by meeting their demand helps people access and afford food.

The Food Aid Convention of 1999 and the World Food Assistance Convention of 2012 set standards for food security support for vulnerable populations, but referred to markets more by a way of negative delineation from markets. The 2012 Convention's second article, on principles governing food assistance, includes stipulations that food assistance must not negatively impact markets. Food assistance must be provided in a way that does not "adversely affect local production, market conditions, marketing structures and commercial trade," states Article 2a. It is also a principle that the parties to the convention abstain from using food assistance for their "market development objectives," as per Article 2b.

After the Great Recession of 2007-09 shook the world out of free-market complacency for a while, the moral impulse for seeking recovery from a man-made financial crisis, in combination with then-thriving international enthusiasm for global development goals and species-wide concerns, led to new international declarations and programs that expanded on the work of the four United Natoions (UN) world food and food security summits of the 1990s and 2000s.

Food security

In the 2010s, markets were acknowledged as contributing systems in food security. The United States (US), in the context of the Obama administration's commitment to a global response against hunger and food insecurity, established the 2010 Feed the Future initiative, aimed at assisting 19 food insecure countries in the Global South. Concepts for the use of markets under food security objectives were developed in correlation, one of which was laid out in a study by the Washington DC-based Center for Strategic and International Studies (CSIS).

As a compilation of policy trends and thoughts at the time, the CSIS study advocated in strong support of the US's determination to fight hunger through market-relevant policies and actions. This was despite that it was at a time, when in hindsight the world was financially challenged, but yet comparatively unperturbed by massive challenges like a health pandemic, wars, or climate trouble, all of which have made this decade much more costly. One recommendation was for reducing supply-side constraints by implementing trade agreements with US partner countries and also lowering protectionist barriers. Other recommendations called for the US to be fostering regional integration in other parts of the world, pushing for reform of international agricultural trade systems, and acting towards the improvement of hard and soft infrastructures in countries which are ridden with corruption, inefficiency, and excessive trade costs.

In the recent peak attention to food security issues in context of the crises of the 2020s, the UN issued the Roadmap for Global Food Security–Call to Action which advocated for seven points of action, four of which were directed at "member states with available resources" and three addressed to all UN member states. These three points included references to the roles and responsibilities of governments in food markets, beginning with an appeal for states "to keep their food and agricultural markets open," and further calling for states to increase their investments in relevant research and development, and "closely monitor markets affecting food systems, including futures markets, to ensure full transparency, and to share reliable and timely data and information on global food market developments." It may read somewhat abstract and state-centric, but at least markets were mentioned under a global list of priorities.

The forces of the market, however, are neither known for obeying governments nor are they social per se. Markets appear to have forever (certainly since their conceptual discovery by economists), worked in favor of the resourceful. This makes for a complicated relationship with food security because of the fact that wants are served well in markets if the wants are backed by purchasing power, but needs without the presence of such means, are not.

Rights, as a category of human self-definition and philosophical debate, have been entering markets as an evolving moral category for less than one hundred years. Not inherent in markets, economic rights have gradually been codified from principles of freedoms of conscience and broad economic imperatives, such as the freedom from want into a series of moral and economic rights, like the right to labor and the right to food.

> The need for market actors to woo customers by meeting their demand helps people access and afford food

The new millennium's expansion of moral concepts with economic relevance, such as the Sustainable Development Goals and the UN Global Compact, today provide a joint mental framework with the economic concepts of stakeholder capitalism and corporate citizenship. Forward-looking companies with long-term profit perspectives as well as defined social agendas have become beholden to sustainability and the responsibilities that determine the societal embeddedness of a business.

NOTES INFORMED BY THE LEBANESE MARKET DILEMMA

Lebanon has a peculiar system of societal organization that combines entitlements of quasi-dynastic or familial, tribal, and religious-based entitlements. This combination produces a predilection to maximize economic opportunities through social networking and the exchange of goods. The system's immersion in the recent crisis illuminates many aspects of the market system which have implications beyond the very painful crisis experience. In this sense of abstract evaluation, the crisis has demonstrated impressively that markets react to all interventions. They can be distorted by well-meaning subsidies, but also by charitable interventions that in turn create black secondary markets.

On a very important, constructive note, markets are extremely resilient and the lingering crisis emphasizes how markets, from regulated to gray, and the blackest of black markets, favor not only those who are financially resourceful – in the form of purchasing power – but they also smile on those who excel in negotiations and the uncovering of new opportunities. Markets in this way have self-regeneration capacities which can be indifferent to state actions, and extend far beyond governmental intentions and inferences.

It is a lesson from the global experience with inflation - a novel shock for the G7 economies in comparison to their experiences of the past forty years - which shows that concentration of corporate market power in times of inflation makes it easier for the strongest to set prices at will. Customers lose sight of the price logic and are confronted with information deficits on the validity of price increases. High-powered market players can use bouts of inflation to pass own cost increases onto consumers and even increase prices further than justified by cost hikes.

In this regard, in a comparison with developed markets' far more intense inflation rate, and the complex inflation shocks exposed to Lebanese consumers shows on one hand how severely weak public controls and ill-managed, understaffed consumer protection systems will amplify the market power of the dominant players. In the markets of food security, it will worsen the divergence between powerhouses and lower-powered stakeholders, but also cause a widening of the societal market sphere through the entrance of non-commercial and social orientation.

On a general level, Lebanon is a prime example to show that markets will be stifled in artificial complacency under conditions of imbalanced monetary and market distortions from cronyism. While the departure from such a situation becomes more painful the longer the distorted system has been practiced, freeing the market from illogical and unsustainable restraints, such as the removal of subsidy schemes and forced abandoning of artificial monetary stability, opens new windows for the rebalancing of market shares, product availability and prices.

> The crisis has demonstrated that markets react to all interventions

This removal of stability under a construed status quo can be marginally beneficial to new entrants and detrimental beyond measure for too many stakeholders in food markets. But in decentralized and informal markets, the beneficial effects of entrepreneurial market forces in the essential good markets might come to play out more quickly than in centralized, highly supervised, or concentrated markets - up to a point.

Markets can incur inordinate divergences in the ability to satisfy wants, but markets in the context of an intact social fabric and a tradition of mutual solidarity can perform better than economic models in the satisfaction of needs. Moreover, as crises reshape the economic playing field, markets seem to have the capacity to eventually produce unexpected benefits for the realization of economic rights and unleash new and socially constructive, economic energies.

By Thomas Schellen

TO RISE FROM RUINS

Markets emerge as needed instruments of food security

The Souk El Tayeb farmers' market on Beirut's Armenia Street has an established feel to it. There are many regulars to be seen on both sides of the small stands. Regular customers are crowding the isles on the main market day, which is a Saturday. Facing the customer streams are market traders peddling fresh produce, flowers, preserves, nuts, hot sauce, chocolate, manakeesh, and an eclectic mix of village goods. Their display tables tend to be crowded, too, as the growers and purveyors of artisanal or small-scale agro-food products make the most of the presentation space that they lease from the market operator – the Souk El Tayeb social organization – for a fee of $12 per day.

The organization does not collect exact visitor stats, but managing partner Christina Codsi estimates that over half of the market's patrons on an average Saturday are locals and regulars. Although, she notes that during the summer, the market also sees many tourists and visitors from the Lebanese diaspora, in addition to a heightened influx of foreign expatriates who reside in Beirut.

According to Codsi, the farmers' market started out as a social venture in the mid-2000s on a rationale of providing market access to small-

scale – usually not land-owning – farms with produce and agro-food products.

Neither Codsi nor her social co-entrepreneur, Kamal Mouzawak, have a farming or food trading background. They wanted to allow farmers to bypass wholesale markets that then and now dominate the distribution segment of the agricultural value chain, but cut into farmers' earning margins while being organizationally opaque and obscure in standards and rules. "When we studied this back in 2004, we realized that a lot of potential for small farmers existed in accessing urban markets," Codsi tells Executive.

Souk El Tayeb has not always looked as solid as it does nowadays. The twice-weekly affair not only has a stable home in a covered hall with an adjacent, small management tract, but is co-located with a "farmer's kitchen" restaurant – Tawlet – and a rural-to-urban retail outlet called Dekenet which is especially strong in food preserves and processed items such as jams, molasses, and oils. Both are parts of the Souk El Tayeb organization, which also includes guesthouses and a community kitchen. By contrast, during its first 15 years, the Souk El Tayeb market led a nomadic existence, popping up in open-air locations around Beirut's affluent neighborhoods.

A TALE ENHANCED BY SHOCKS

Whereas there are no exact metrics for comparison of same-stand sales at Souk El Tayeb for daily, weekly, monthly, and annual visitor numbers at the current location, Codsi confidently confirms the market's growing reach in its urban catchment area. Vendors have told her they are increasing their sales in the past 12 months, while she has also observed that the location has been working well. "We know that demand is strong because the farmers run out of stock all the time. Since day one after opening last year, we had an invasion of people," she says.

And this is where the Souk El Tayeb venture tale turns Lebanese-metaphorical. "The past three years were turbulent and many things happened," Codsi says, an epic understatement. As she continues her narration, she mentions three disruptions to the operation in less than two years, shocks that were also key moments in shaping the nation's mindset.

These disruptions began with the nomadic market's closure during the thawra protest waves of October, November and December 2019, which continued with the Covid-19 induced lockdown periods of spring and summer 2020. Finally, there was the total disaster in August 2020, when what became the current site of the organization, quite literally was blown to shreds.

This is to say that Armenia Street in its entire length is situated in the area that was hardest hit by the August 4, 2020 port explosion, and the present, permanent location of the Souk El Tayeb is in one of the most devastated parts of the central-northern section of Beirut, which was turned into an urban disaster zone by multi-tier criminal negligence.

Metaphorically, it is a rise from the ruins of a dysfunctional system that has been dealt the final blow by inaction and corrupt indifference

"These moments make you think of the end of the world but then there comes a moment when you know that you need to move on," Codsi reflects. The market vendor's reported increase in their sales, and the growing footfall at the operation has to be seen against the backdrop of the restart of Souk El Tayeb at the Armenia Street site less than two months after the catastrophe.

Metaphorically, it is a rise from the ruins of a dysfunctional system that has been dealt the final blow by inaction and corrupt indifference. In economic terms, the increase in revenues – which is not an increase in profitability – demonstrates the viability of a new, and copied, direct-to-consumer niche in the Lebanese food market. As well, it shows the great need – and profound opportunity – to work towards and eventually achieve consolidation and sustainability.

Codsi sees a number of factors in play in driving consumer interest in farmers' markets and shopping local products, rather than being obsessed with branded imports. These factors in her estimate included changing price structures: "Imports started being very expensive," she says, as well as the growing awareness "of the importance of eating local, clean, and authentic Lebanese foods" among the organization's target audience, and also the pandemic-induced trend towards cultural introspection, under which people started paying more attention to what is being produced in their locality.

SOME SPECIFICS OF A SOCIAL MARKET OPERATOR

The room for growth, need to realign food value chains, and improve market efficiency, or more importantly blur social efficiencies, is unmistakable when Colsi points out that the Tawlet hospitality operation at the central location has seen stable revenues, alongside a 10 to 15 percent increase in sales volume at three locations outside of Beirut in 2021. A further sales improvement is expected for FY 2022 due to a booming summer season. However, this is juxtaposed with the fact that the menu prices at the central Tawlet, for example, had to be slashed by 20 or more percent in dollar terms versus the pre-crisis offer.

The charitable activity underscores the persistent lack of food security on a national level, and the need for developing safety nets

Thus, while the success of the market speaks to the ability of improving food availability, producers' direct market access and food security, the economic sustainability model has to be vastly improved to make this example of the direct-to-consumer niche become a pillar of local food security. Just as transportation costs are challenging farmers who want to bring produce to any farmers' market in Beirut, rising costs put a lot of pressure on the bottom line of the Beirut operation of the Souk El Tayeb organization, despite the benefits from consolidating the market, store, and hospitality outlet under one roof.

Energy costs consume half of the revenues of the market, and the $12 per day stand fee has not been set with a profit motive, according to Codsi. "The cost of functioning is greatly increased. We cover costs of Souk El Tayeb jointly with Tawlet and Dekanet operation. The restaurant and shop have been doing good sales, but it is a constant fight to maintain limited profit," Codsi says.

On the social equity side, the organization's initiative at the time of its opening in Armenia Street led to setting up of the Matbakh El Kell community kitchen with 2,500 meals per day capacity, in partnership with foreign funders, local charities, and NGOs. It is an example of how Lebanon's plunge into crises has been triggering community-level support responses which are inadequately accounted for in ubiquitously cited estimates of food insecurity. But at the same time, the charitable activity underscores the persistent lack of food security on a national level, and the need for developing overdue safety nets. "We thought that we would operate it for a year and close it again but then realized that the demand is actually growing," Codsi explains.

As it is with retail markets in general, the reality of a previously overvalued currency and unsustainable consumption on household and institutional levels loom large in the promising economic niche where farmers access urban markets. This distorted past screams from margin and price deterioration pressures for Lebanese producers and food services providers, when present price levels are compared against the "fresh" dollar, which is de-facto predominant in all segments of the food value chain.

THE SITUATION ON THE SIDE OF CONVENTIONAL RETAIL

In the wider retail market segment of medium-to-low end supermarkets, the challenges of

contributing to food security are expressed in ways that put the narrative of the substitution of food imports by locally produced foodstuffs into a more realistic perspective, and reveal how the crisis might have engendered market concentration shifts in favor of the biggest players.

As to the progression of food imports substitution, Hussein Bashir, procurement and operations manager at Bashir Business Center, first thought that the Lebanese market would be "flooded with Lebanese products," but it did not turn out so, he tells Executive. Bashir runs the 1,000 square meter wholesale and retail enterprise and supermarket in Choueifat, south of Beirut. Consumers can find more than 2,000 stock-keeping units (SKU, a codified number that represents specific items available for sale) in the supermarket's food section.

Instead of a surge in local products, however, markets frequently down-shifted on price points by substituting brand imports from Western Europe and North America with imported processed food from more competitive producer countries which undersell local agro-industrial manufacturers, Bashir confirms. He says some consumer needs, such as detergents and household disinfectants with variable quality, are today supplied locally. But others, such as budget-price sweet biscuits and chocolate wafers which have a domestic manufacturing history going back to the 1950s, are not the cheapest in the market since they are challenged by wafer products made in Turkey.

In examples as diverse as beer, confectionery, and pasta, an alert consumer may indeed have encountered situations where imported products, sold under the house brands of large retail chain, as well as products sourced from agro-food producers in countries with large populations, were equally priced or sometimes significantly underselling local brands.

RETAIL WITH A CONSCIENCE

Another observation of market-influencing change, which is especially notable in the context of reported extreme poverty rates, comprises of revealing consumer preferences. "Sales are still low as a total number but are reverting to the ways things were [before the crisis] in terms of consumer behavior. They show a mentality of 'if I want it, I will get it'," Bashir notes. The instant gratification demand, according to him, has caused items which stopped selling during the crisis to sell in a stable way. "The consumers would for example at some point have considered a Mars bar to be a luxury, but now they are putting them again into their shopping carts. Even though it costs a lot [in relation to lira incomes], consumers are willing to spend this much," he says.

This is opposed by extreme price-consciousness of consumers on other parts of their shopping lists. Strategizing to cope with competition continues on a marginally or even hypothetically supervised playing field. For several years prior to the crisis, Bashir Business Center was developing two house brands: one for canned fish and one for canned vegetables. In the environment of depleted purchasing power, however, the customer base is hunkering heavily after the most cut-rate cans on offer.

> In the environment of depleted purchasing power, however, the customer is hunkering heavily after the most cut-rate cans on offer

"We have a can of tuna that retails for $1.5, one for $1, and one for $0.5. Consumers are seeking out the cheapest one," he explains, but points out that these price tiers represent quality differences in the fish, with consumers apparently not prioritizing that consideration if the lowest priced-can satisfies their nutritional needs. "In some retail markets today, you see certain products that are dubious or not worth buying, and it is hard to compete in a market where such products are present," he says.

He adds that he has in a personal capacity recently conducted market research on zaatar (thyme) for a friend who, like himself, hails from South Lebanon, and discovered that not everything sold as a budget mix of the healthy herb was containing much zaatar at all.

"You might buy a cheap brand of zaatar and find that it mostly is made from wheat. [Traditional quality mixes] usually contain sumac, zaatar and sesame. What the low-end producers are putting, is citric acid, a lot of salt, and some broken wheat like burghul that is passed on as sesame. There also are mixes with a high share of crushed semolina that is passed on as zaatar. These are locally packaged products of questionable origin in either Lebanon or Syria."

Markets face challenges in balancing the consumer search for the cheapest offer, with their interest to gain customer loyalty and satisfaction by providing budget products of reasonable quality. What Bashir describes confirms that food security and quality can be an issue for both cheap imports and local cut-rate products. Against the dangers of fake products and unhealthy ingredients, many retailers know that they have an important social and economic interest in directing their customers to the best-available quality products at differing price points, yet they cannot perform this function without the regulatory and supervisory function of public institutions.

A PILE OF FURTHER CHALLENGES AND THEN PROBLEMS OF MARKET CONCENTRATION

On top of factors such as having to cruise the aisles to assess price displays for accuracy, and initiate changes in accordance with rather imprecise information on the Lebanese currency, and the latest supply chain impacting events, retailers suffer further from labor supply and engagement issues. "We have more labor, but we have less quality labor," Bashir says.

According to him, the most qualified persons are no longer in Lebanon, even at the level of farm labor and retail store labor. "What we used to get done by one worker, we have now to use two to three untrained and unmotivated helpers. These days, not only workers but even managers are unmotivated, even owners are unmotivated. It is getting hard for everyone to find motivation to work. I don't know how to motivate my workers when it is hard for me to be motivated," he muses pensively.

> "What the low-end producers are putting, is citric acid, a lot of salt, and some broken wheat like burghul that is passed on as sesame."

The competition with what Bashir calls three "whales" in the Lebanese retail space – chains with very strong market power concentrations in

"I wake up every day and check the news to see if Russia has done this or that. Then I go to the store and, if necessary, raise the price of imported sunflower oil."

modern retail in comparison to competitors – has possible short-term impacts which are detrimental to impoverished persons' access to food and also more longer-term implications of potential gloom.

"During the crisis, suppliers have given these whales many benefits, which helped them grow and eat a lot of market share," Bashir says. He alleges that suppliers were accepting banker's checks from the mega-chains at times when these were not accepted from other retail companies and also would have priority in seeing their stock orders filled at times when supply was constrained to a minimum. "They would get bigger portions in comparison to competitors, so that consumers would find everything at [their supermarkets]. This was harming business for everyone, and I hope that this will rebalance at some point," Bashir says.

In evaluating the role of retail markets in the economic context of access to food, it is finally important to note that factors which impact food security on the consumer side have arisen on the fronts of inflation and external threats. "I wake up every day and check the news to see if Russia has done this or that. Then I go to the store and, if necessary, raise the price of imported sunflower oil," Bashir comments, describing a new routine that he says never before existed.

Inflation spikes imperil food security, but hit retailers in their revenues and margins, he testifies, and inflation adjustments – by evidence seen in the local food-retail sector in either direction – are therefore often hesitantly implemented and with time lags at the retail level. All efforts notwithstanding, however, the impact of supply chain risk, currency risk, and sovereign risk on Lebanon will find no other final outlet than these food insecurity risks with the retailer or the consumer, and the despondency devil proverbially takes the hindmost.

In the end, the food security and food safety situation of Lebanon from the markets' perspective is conflicted. Social ventures appear to be in a better position to contribute to food security through different channels they are attuned to when compared to conventional retail. However, conventional retailers do not operate without consciences and regard for their long-term economic sustainability. The markets have not failed, in the sense of their ability to deliver products to people who can afford them. There are new opportunities and open windows to growth for retail markets just as they exist for food entrepreneurs, artisans, and industrialists, but these opportunities are juxtaposed with systemic gaps, inefficiencies and shortfalls. All of the latter combine into a system of failures that is very costly and stands against the potential of the retail sector to ultimately, even if indirectly, enhance the food security of the Lebanese people and restore it to the levels that existed before the economic collapse.

By Thomas Schellen

LESS HYPE, MORE HOPE

The prospects for Lebanese food security in contexts of time and species

It was a sequence of electrifying experiences for a kid from the German provinces. It began with looking in awe around the grand movie theater in no less than Leicester Square, London, and soon went on to being captivated by the cinematic depiction of abject misery of children in a workhouse, and then to being shaken by the hymnal intensity of one of the first English songs that this youngster heard and actually understood – at least the words "food" and "glorious." Ergo, the imprinting of memes from seeing the musical "Oliver!" while on vacation around the time of having had the first English lessons in high school, for yours truly, still makes for one very strong chain of associations when the word "food" comes to mind and food security is on the table.

This year, food has surged to the top of international concerns. Political and civil society agendas have been filled with statements on food security, respectable magazines are putting the topic on their covers, and the International Monetary Fund at the beginning of October added a one-year "Food Shock Window" to its emergency response toolkit. The first disbursement from $1.3 billion worth of Special Drawing Rights was made to Ukraine in response to imperilment of the country's balance of payments due to wheat export revenue losses.

One has to note with both surprise and conviction that what the simple word food, and even more so the inconspicuous word combination "food security" means and stands for in 2022, is actually as laden with contradictions as it was some fifty years ago. And that was at a time when the modern narrative of food security was empowered by the development of high-yielding, corporate involvement supporting crops. Moreover, the perils of food insecurity are in many parts of the developing, and even the developed, world today as present as they were in Europe almost 200 years ago when Charles Dickens wrote his stirring novel "Oliver Twist", adapted for film in 1968, about the dichotomous social realities that existed at the time of Britain's adoption of the poor law amendments. It serves today to remind us of two things: that food is vital for social peace and coexistence and that food crises keep haunting the world to the point that calling food security both a great need and a contentious issue, is an understatement.

EXISTENTIAL CONTRADICTIONS

Food is full of contradictions. Nutrition is vital for human bodily sustenance and mental health but food is also sensual, emotive and cultural. This is the first contradiction. We cannot hope to cover the cultural value of food by addressing the – indispensable – issue of improving nutrition and lowering food insecurity.

The second contradiction is that the economy of food has been expanding tremendously and that this economic cosmos of food, which includes food expenditures of households as well as the aggregate GDP contributions of agriculture, agro-industry, and industries that are food related, such as beverages, hospitality and restaurants, are riddled with economic dichotomies. For example, whereas in 2022 food insecurity has globally been rising for four years and still is rising precipitously for millions under the specter of future climate trouble and global recession, the world's largest food com-

pany and the largest restaurant multinational, are doing very well. Nestle and MacDonald's, have recently reported better than projected results for the first nine months of the year, with nine-month organic revenue gains of 8.5 percent in the case of Nestle and third-quarter 10 percent improvements in global comparable sales for MacDonald's.

A third, enduring food contradiction relates to fair and principled access. More wheat is being harvested around the world than ever before, and there is more than enough food to feed all – but the amount of food that goes to waste around the world each year in our highly educated, highly networked, and supposedly efficient global economic system, is staggering. The United Nations World Food Programme says that almost one third of food produced each year does not get eaten. The 1.3 billion tons of unconsumed food, according to the United Nations Food and Agriculture Organization's (FAO) website, entails loss ratios of estimated 14 percent between harvest and retail and 17 percent at the retail and consumer level, whereby an 11 percent household-level wastage of food is the primary culprit of the estimated 17 percent of total global food production that goes to waste each year. "Food that is lost and wasted accounts for 38 percent of total energy usage in the global food system," the FAO laments.

ZERO HUNGER, RESPONSIBLE CONSUMPTION AND PRODUCTION GOALS

In this emerging third decade of the century, the obscene historic inability to match food needs and supplies is newly exacerbated by humankind's oldest enemies: ourselves and the forces of nature. Climate and war and diseases – of plant and animal and people – seem in the last few years to have been threatening our planetary food security to degrees that policy makers and activists may not have not been thought imaginable 22 years ago, and again only 7 years ago when they debated and devised the declarations of Millennium Development Goals (MGDs) and their successors, the Sustainable Development Goals (SDG).

In the first and second decade of the century, hopeful aspirations for the eradication of poverty and "zero hunger" were adopted as global targets by the UN, first in the Millennium Declaration of 2000 and reiterated and expanded as SDG 1 and 2 in the Sustainable Development Goals of 2015, with SDG 2 calling upon nations to "end hunger, achieve food security and improved nutrition, and promote sustainable agriculture." This year's worries over short-term and longer-term increases in acute food insecurity, which have been triggered by the Ukraine conflict but are in the long run interrelated with deep climate fears, are departures from this previous SDG optimism.

Moreover, SDG 12, which postulates a shift towards responsible production and consumption patterns, listing food first among the areas where production and consumption are far behind a responsible and productive equilibrium. Available data on food waste and loss are inconclusive with regard to measurable reduction of the numbers such as the billions of tons of unconsumed food. A 2018 report on progress toward SDG 12 from the year 2000 up to that point, notes that there has been progress in the development of policies and in research but admitted that "the application and implementation of these to foster concrete and tangible changes in practices and impacts remains limited."

More wheat is being harvested around the world than ever before, and there is more than enough to feed all

The impressive agreements on the MDGs and SDGs shine as peak expressions of optimism during a long cycle of political calm and economic peace after the end of the Cold War, a period when faith in human capacities and good will were burgeoning. But the current immersion of SDG optimism into deep water suggests some of the SDG enthusiasm towards the later 2010s fed into a wave of cornucopian beliefs which celebrated themselves under disregard of serious warnings over the long-term shameful fiasco of humanity in managing our own species, and the planet that it inhibits.

This is to say that in the global risk aggregation of the past few years, humanity could have witnessed the epitome of divergence between a pious wish for no poverty and zero hunger and a reality of a world being treated to willful and continued denials of environmental and climate costs. These costs have throughout the capitalist era and into the present time been externalized by industries, ignored by policy makers, and underrepresented in modeling by economists who were more interested in coming up with theories that would accelerate or preserve growth than with developing models that showed the risks of human economic activity.

AN UNDERAPPRECIATED REPORT

Perhaps the purest expression of this culture conflict between dogmas of growth and warnings of human risk was the debate over the population bomb, and the modeling of global resources exhaustion detailed in the "Limits to Growth" book lead-authored by American scientist Donella Meadows. The 1972 original study famously endeavored to warn of unencumbered growth in industrialization, resource depletion, pollution, food production and population, auguring on the basis of a novel computer model that on unchanged trajectories of those factors, "limits to growth on this planet will be reached sometime within the next one hundred years" – a maximum deadline that passed to 50 percent at the advent of this year.

If one continues along this logic of a dialectic of growth and risk, the part desperate and part over-optimistic bent of UN debates at the time when the MDGs were designed and announced as achievable in the year 2000 could be read as antithetical positions to what Meadows and her co-authors concluded in their revised edition, "Limits to Growth: The 30-Year Update" (NLTG). But this dialectic is lessened at first glance by the fact that in some of the ten scenarios that Meadows – shortly before her death due to cerebral meningitis – and her team explored under an adaptation of the World3 computer modeling framework used in Limits to Growth, there is a spark of sustainability.

Diverging from the greed-as-usual and consumption-as-usual presuppositions that rule more than half of the NLTG scenarios, in only one scenario, (and from timing perspective non-implementable) key sustainability policies are introduced already in the 1980s. Meadows et al conclude that their World3 model's assumed goals for industrial goods per capita cannot be reached for a world population greater than 7 billion people – an amount which has been passed in the last decade – and that delays in introducing fundamental change to human behavior "reduces the options for humanity's long-term future." In full cognition of this dilemma, the NLTG authors still see open pathways for a global transition to a sustainable society, which to them is a society that sustains "the needs of the present without compromising the ability of future generations to meet their own needs."

The first "future generation" envisioned in NLTG, has already been born and is presently aspiring to shape society to their needs. It is a digital-native generation of more-educated and more-connected-than-ever youngsters who have experienced immense exposure to ahistorical and absolutist ideologies, fake news, and virtual pressures disseminated through faulty social networks. They are confronted by the climate risk mitigation failures of the two preceding generations, plus have to grapple with their unexpected and mentally unshielded vulnerabilities to pandemics, wars, and extremist and populist leaders of all ideological colors and non-compromise persuasions.

Hopeful aspirations for the eradication of poverty and "zero hunger" were adopted as global targets by the UN

This does not bode well for utopian optimism. Jorgen Randers, one of the co-authors of the original "Limits to Growth" and its 20- and 30-year follow-up publications: "Beyond Limits to Growth" and "Limits to Growth – The 30-Year Update", has commented discouragingly on the worldwide outlook on the 50th anniversary of the original study's publishing date of March 1972.

"Fifty years later, we know that the world has followed the scenario predicted in the book – broadly speaking," Randers opined, and prophesied that over the coming decades, human wellbeing will decline with a "too-little, too-late" scenario continuing in response to a dual threat of overshooting nature's support capacity and of rising social tensions. "In effect, I believe that regional social collapse will precede global environmental collapse," he lectured darkly.

PERPETUAL OSCILLATION BETWEEN MISERY AND HAPPINESS

But even if the propositions of SDG 1 and 2 have been losing momentum to the point of reversing, learned pessimism is not necessarily the view that prevails in the end. The Malthusian trap is not inescapable and what Thomas Robert Malthus believed to be an obvious truth, that "population must always be kept down to the level of the means of subsistence," has been dismissed by human progress in terms of population and food supply in the past two centuries since the insightful parson and economic thinker published his speculative work, "An Essay on the Principle of Population".

The disproving of Malthusian population risk dynamics notwithstanding, the correlated polar juxtaposition of Malthusian and Cornucopian views on the fate of society, of which the latter belief stipulates that the future will always be saved by economic means or technological innovation, and which has been clashing throughout the modern ages with the former's skepticism on human superiority, cannot be disregarded. It should rather be acknowledged that this dialectical contest of wits in what Malthus described as debate between those who claim that "man shall henceforth start forward with accelerated velocity towards illimitable, and hitherto unconceived improvement" and those who see the fate of the species as "condemned to a perpetual oscillation between happiness and misery" in their chase after an unattainable perfect society, lately seems to have again been moving towards the Malthusian corner.

But it is exactly this point where lies the best Lebanese move in the worldwide mental tournament on food security: the country may be best advised in taking a contrarian, anti-cyclical route that steers clear of Malthusian philosophy. Whereas the global route of SDG over-enthusiasm has been curtailed by climate concerns and widening social fault lines, and whereas the threat of food insecurity is escalating in many developing countries, it stands to reason that Lebanon can still be elevated into a comparably comfortable situation with regard to food security – if it only applies the food security insights, SDG wisdoms and rational agro-sector development strategies that have not been implemented in this country during the 20 years between 2001 to 2020.

There are certainly limits to the national food security potential if considered in a narrow sense; Lebanon will not be able to create large-scale agriculture that produces millions of tons of commodity crops. In terms of food safety - an important and currently weak pillar of Lebanese food security - the presence of cholera is urgent but only the latest warning shot signaling that the combination of crowding people into deprivation zones with substandard infrastructure creates kill zones for epidemics.

However, Lebanon to this day has an upper-middle-income country's capacity for healthcare and could have a clear path to food safety if it were to improve critical infrastructure and implement, supervise, and enforce regulations more thoroughly. On the side of securing the nutrition needs of the population, much has been theorized about the creation of social safety nets that even the filing cabinets in the concerned public sector institutions must be able to answer all questions about their essentials.

Finally, as a country with excellent food production potential but efficiency deficits in food production – such as shortfalls in advanced harvesting equipment, good testing, storage, and packing infrastructure – Lebanon can do much to lower food loss. The economic conditions of widespread poverty bring with them a chance to educate consumers on avoidance of food waste and on healthy, inexpensive nutrition. In economic terms, with all appreciation of the increase in food security that by local standards large processors and branches of multinationals bring to Lebanon, the best path to food security is indirect and based on small but sophisticated and institutionally incentivized agriculture and agro-processing.

> The presence of cholera is urgent but only the latest warning shot around substandard infrastructure

This indirect path should be trodden by implementing the applicable global standards, developing the identities and brands that appeal in foreign markets, and moving out of ethnic niches. But at the same time strengthening food sovereignty – in sum, by producing more for export markets and by modernizing the amazing native food culture. Then, by contributing to constructive global food interdependence – which conceptually negates the contradiction between food as physical sustenance and food as a cultural asset and trove of sensual treasures – food security might cease to be a concern in the sense that zero hunger can be achieved in Lebanon.

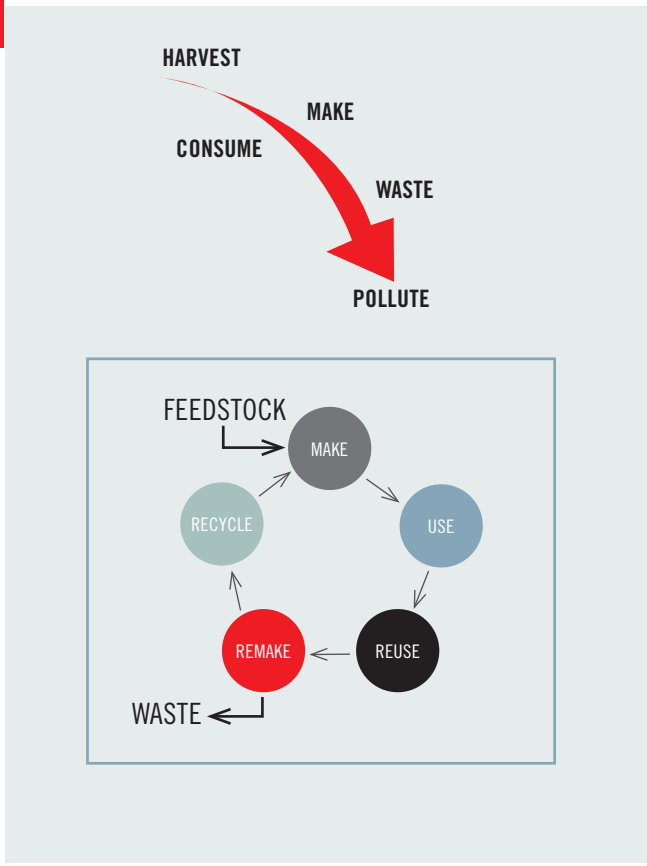
By Carl Safi

CIRCULAR AGRICULTURE

An opportunity to boost the Lebanese economy

Circularity is an approach that has been intensively studied over the past ten years. It is based on three main principles: designing out waste and pollution; keeping products and materials in use; and regenerating natural systems. It fundamentally differs from the traditional linear economy where products are produced to ultimately become, after being used, low-value products or waste (Figure 1). Whereas in the case of an ideal circular model, the products enter into a closed-loop where each component of the product will be valorized and re-injected into the cycle for similar or different use in the market. Therefore, no waste is generated, the value of the product does not decline, and it has a positive environmental impact. The circularity approach applies across a range of industries such as agriculture, textile, construction, energy, plastic, furniture, alcohol, and many others. However, before diving into circular agriculture, it is worthwhile spotlighting on a plausible example that is in line with the circular economy: the refurbishment of electronics. Refurbished items are reconditioned, verified, tested and given a second or even third life in the market. They are affordable, as efficient as new items, and most importantly, the environmental footprint associated with refurbished electronics manufacturing is significantly lower. Undoubtedly, a perfect circular process is not realistic for every single sector given that some waste is expected and thus fresh new feedstock will always be required, but to a much lesser extent (Figure 1). Therefore, another challenge for the optimal system is to source the inflow of resources from sustainable sources and use the residual flows leaving the circle low value applications (energy, compost) or in other sectors if possible (Figure 1).

FIGURE 1: A SCHEMATIC COMPARISON BETWEEN LINEAR AND AN IDEAL CIRCULAR ECONOMY



MAXIMUM VALUE FROM AGRICULTURAL RESIDUES

Agriculture plays an important role in the Lebanese economy. It is vital that it adopts the circularity approach in order to be sustainable and increase the value of its crops. Therefore, an optimal processing cascade to valorize the agricultural side streams or leftovers will certainly increase the value of the crops, thereby closely integrating the circular model. In agriculture, it is important that the circularity model takes into consideration the cascading process that will first valorize the valuable components into high-end applications and the remaining into low-value applications (Figure 1).

Among the main Lebanese agricultural industries are grape, apple, potato, orange, lemon, tomato, carob and olive. All these resources have been present in the Lebanese market for decades. However, they generate large leftovers or side streams which are not well managed. In most cases, they are either disposed or burned, or transformed into compost to fertilize fields. This indicates that Lebanese agriculture complies more with the linear approach that the Ellen MacArthur Foundation, a charity advocating for a circular economy, often describes in three main stages: take (harvesting of raw material), make (item production), and waste (use and ultimate disposal of the item). Using agriculture residues as fertilizer and soil enhancer is already a form of circularity. This is already a step forward in sustainability to synthetic fertilizers. Nevertheless, this approach underesti-

In addition to its positive environmental impact, the circularity approach has promising economic prospects. According to McKinsey and the Ellen MacArthur Foundation, the economic potential of a circular economy is estimated at $1 trillion globally. That potential has led to the emergence of many startups across the Middle East and North Africa (MENA) region that focus on disruptive ideas as alternatives to traditional approaches. Consequently, in the first half of 2022 alone, nearly $2 billion was raised from startups in the MENA region. Despite its disastrous situation on all levels, Lebanon held the second position after the United Arab Emirates in terms of fund raising. The implications of this ranking confirm that Lebanese entrepreneurs are resilient, knowledgeable, and surely capable of overcoming the unprecedented struggles that Lebanon is currently facing.

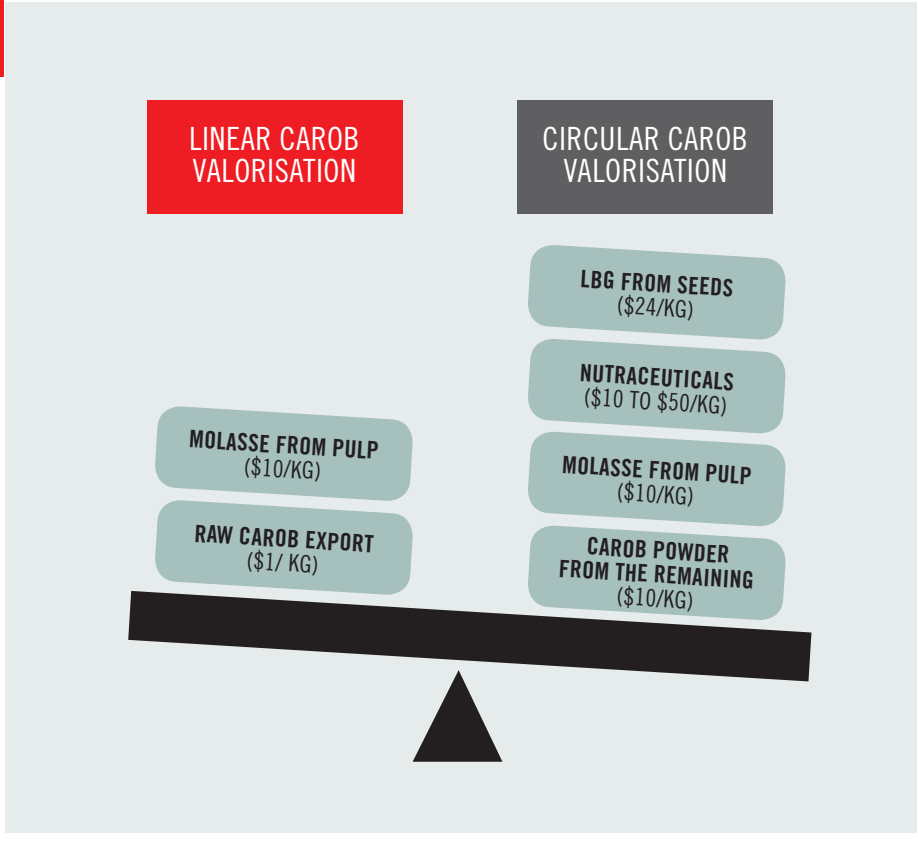
The economic potential of a circular economy is estimated at $1 trillion globally

mates the true potential of agricultural leftovers. Agricultural residual streams are loaded with a wealth of valuable components that can be used for food, feed and biobased materials. Among these components are proteins, fibers, nutrients, unsaturated fatty acids, polyphenols, starch, sugars, fructose, sucrose, and the list goes on. This implies that a number of valuable applications can be developed and an additional line of revenues can be sustainably generated. Therefore, Lebanese agriculture should adopt a more modern approach to valorize its agricultural leftovers and avoid selling its raw material at a cheap price. In addition, agricultural residues should not be looked at as a burden but rather as an economic and environmental opportunity.

Let us take the example of carob; a bean legume with an industry that generated $802 million in 2020, and is forecasted to grow at a compound annual growth rate of 6.4 percent within the next eight years. Every year, Lebanon produces around 4,000 tons of carob that is either used to make mo-

Agricultural residues should not be looked at as a burden but rather as an economic and environmental opportunity

FIGURE 2: A SCHEMATIC COMPARISON BETWEEN LINEAR AND CIRCULAR VALORIZATION OF CAROB



lasse or a carob-based milk beverage, or cheaply exported ($1,000 per ton) abroad. However, given the growing interest in carob constituents and their health benefits, multiple applications have been created from carob and their leftovers that go beyond the production of molasse. Accordingly, industries are interested in Locust Bean Gum, a natural thickener that can be found in carob seeds and used in food applications, nutraceuticals, cosmetics and other biobased materials. There is also an interest in carob powder as a cocoa alternative. Therefore, a simple economic extrapolation (Figure 2) shows that the benefits of adopting the circularity approach by valorizing these high value components outweigh the benefits of the traditional approach by 10 to 30-fold after including the costs associated to the production of these applications.

SUSTAINABLE GENERATION OF PROFITS

Lebanese farmers and producers have the edge when it comes to carob because these trees grow in the Mediterranean region. Given that the interest in carob ingredients is rising exponentially across the globe, Italy, Spain, Portugal, and Cyprus have started to intensify the cultivation of carob trees in order to gain a bigger market share and properly valorize this crop. Lebanese farmers should follow the example of these countries to take part in this growing industry and benefit from Lebanon's perfect geographical location to grow carob trees. Moreover, Lebanese farmers should start to think big by producing and selling the (intermediate) products rather than the raw materials.

Lebanese grape production is another example that should adopt the circularity approach, especially when it is associated with wine production. A large amount of grape pomace is generated after producing wine. It is estimated that 1 kilogram of pomace is generated for every 6 liters of wine. Overall, Lebanon has produced 9.7 million liters of wine so far in 2022, which implies that around 1,620 tons of pomace have been generated. The price of grape pomace compost is estimated at $4.5 per kilogram. Grape pomace is composed of grape skins, grape stalks, and grape seeds. Polyphenols range from $5 to $100 a kilogram depending on purity, and pectin from $25 to $35 a kilogram, are abundant in all of these fractions. The seeds are also rich in polyunsaturated fatty acids (from $5 to $35 per kilogram) and proteins, whereas the stalks are rich in fibers that are suitable for biochar production at $2.5 per kilogram. However, despite these facts, Lebanese farmers in general are still selling grape pomace as compost or disposed of, thereby neglecting its true value in a linear form. Thus, rather than simply transforming grape pomace into compost, it will be worthwhile adopting the circularity approach to properly valorize this side stream and sustainably generate ten times more profits. The same approach applies on other Lebanese crops like olives, acorn, apples, tomatoes, potatoes, lemons, and oranges.

Agriculture in Lebanon should not be seen as a low value domain but rather as an opportunity in which new technological advancements and approaches should be incorporated. Nevertheless, a major change of mindset should be established by starting from basic education up to advanced education in order to increase awareness and provide guidance in how to develop Lebanese agriculture. The circular economy model is the fruit of over a decade of research that validated its efficiency in a world that is witnessing major ecological shifts, and it is a true economic potential for Lebanon. Major corporations across the globe have adopted the circularity approach, and many startups are following the same model by creating new ideas that gravitate around circularity. In a lot of economically thriving countries like The Netherlands, such models and innovations are strongly encouraged and facilitated by investing in research, education and subsidizing projects. Unfortunately, due to the lack of financial resources and supporting governance, the Lebanese government does not have the means to support such initiatives. Alternatively, the private sector, NGOs, foundations, associations, the Dutch embassy in Beirut, agencies like USAID and UNDP are very active in Lebanon and they must lead the way to make a positive impact with such development projects. Furthermore, Lebanese people are very ambitious, educated, driven, courageous, and willing to embark on new disruptive ideas that will make a positive difference and contribute to Lebanon's self-sufficiency and sustainability. The combination of private sector, non-profit organizations and Lebanese people will certainly put things on track for a better valorization of agricultural leftovers.

> Using agriculture residues as fertilizer and soil enhancer is already a form of circularity

Carl Safi, PhD, is a biorefinery expert at Wageningen Food and Biobased Research in The Netherlands

Comment

By Alexis Baghdadi

LAND OF MILK AND HONEY?

Food security solutions forget the power of the honeybee

In 2019, 'Honeyland', a documentary produced in a little-known country in what the United Nations calls East Central and South-East Europe, earned wide critical acclaim and won international awards. It tells the poignant story of one beekeeper in North Macedonia. In the documentary, greed and the lure of easy profit swiftly eradicate traditional knowledge and respect for nature, ending in tragedy for both Man and Honeybee.

Contrary to widespread perceptions, it most probably was not Albert Einstein who predicted that humanity would die if bees went extinct. But the cause-effect relationship is true nevertheless. Surely you have heard the saying that if you teach a person how to fish, you feed them for a lifetime? The saying makes sense – at least until our seas and rivers can no longer provide enough fish for a sprawling and hyper-consuming human race. The same is true about teaching people to grow food or keep honeybees; how long before the planet is unfit for both our crops and our honeybees?

Now, consider that crops and honeybees cannot exist without each other. Honeybees have been here for millions of years, and primitive beekeeping dates back at least 10,000 years. But only a century ago did scientists begin to understand the true gift of bees: pollination, and why we would die without it. Around three-quarters of our crops depend on pollinators like honeybees to yield fruit and vegetables.

So yes, we should be very worried about going hungry. As the 2022 United Nations Climate Change Conference takes place, agriculture and food security find themselves once more on the sidelines of top discussions, and honeybees are nowhere to be heard. A silent spring without these striped pollinators would spell the end of food security faster than anticipated.

MAGIC SEEDS AND OTHER GRIM TALES

This scenario is not based on conjecture or fantasy. In the past two years, the number of people facing food insecurity worldwide has almost tripled to reach 345 million, according to the United Nations World Food Program. While conflicts, COVID-19, and climate shocks have exacerbated this food crisis, it is becoming more apparent that the fault lies with the currently prevailing food system.

For the past 50 years, what started as the "green revolution" has promoted industrialized agriculture as the solution to world hunger. The model for this food system relies on intensive practices of planting large monocultures of single crops, supported with fossil-fuel based and chemical fertilizers, pesticides, and other "ides." Initially, this model concerned food crops, but it soon spilled over into non-food crops like cotton, cattle feed, biodiesel raw materials, and so on.

> Around three-quarters of our crops depend on pollinators like honeybees

And what if the production of these crops is threatened by conflicts? Pandemics? Climate change? Use more chemical inputs or more resistant seeds, says "Big Agriculture" and its minions. As recently as September 2022, Bill Gates pitched bioengineered (read: genetically modified) "magic seeds" able to resist climate change as the only solution to world hunger. Who would control these seeds? Can they really solve hunger? We are not sure.

We are even less sure about the fate of honeybees. We have witnessed industrialized agriculture initiatives like the Alliance for a Green Revolution in Africa fail to alleviate hunger. What we should now start worrying about is how it actually destroys ecosystems that nurture honeybees and other pollinating insects, but also birds, bats, microscopic organisms, and even larger mammals – all of which make up the ecology of natural life-sustaining systems.

PROBLEMS ABUZZ

The Syrian honeybee (Apis mellifera syriaca) is the native honeybee subspecies of Lebanon, Jordan, Palestine, and Syria. It is ideally adapted to dry climates, resistant to pests, and blessed with a profusion of endemic nectar-bearing plants. Today, the Syrian honeybee is all but gone. Over the past century or so, it has been replaced or cross-bred

with imported Carniolan honeybees (Apis mellifera carnica), a subspecies of bees from Europe that is much tamer than its local cousin. Recently, other "immigrant bees" have been flown in from Egypt and the United States, promising higher honey yields and less stings.

Why is this a problem? Mainly because of a lack of education or responsibility. Few beekeepers or project leaders acknowledge that the close proximity of beehives from different producers makes bees susceptible to disease and loss of genetic traits.

First, female queen bees mate with any male drones brave enough to approach them (the mating ritual is intense and lethal for males). A pure-bred queen may take on undesirable traits from a male. Beekeepers often have to buy queens from specialized breeders (local or overseas) to ensure their bee stock stays pure.

Second, newly introduced bee species are less resistant to diseases and pests, requiring beekeepers to import expensive treatments and equipment. Worse, if bees are not treated for these diseases, they can easily contaminate beehives of other beekeepers. By the time beekeepers realized the benefits of the Syrian honeybee's resilience and sought to cross it with their own weaker breeds, the original subspecies breed had been largely diluted or gone.

The Syrian honeybee is the native honeybee species of Lebanon

Third, the number of beekeepers continues to swell through well-intentioned livelihoods programs financed with foreign aid. This means more bees competing for food in decreasing natural spaces due to rampant urbanization and climate change, leading to lower honey yields each year. The old-timey solution of feeding "sugar-water" to bees as an

A NEW(?) HOPE: AGROECOLOGY

Simplistically defined, agroecology is where agriculture meets ecology. It is by no means a new or revolutionary approach. Agroecology, sometimes referred to as natural farming, permaculture, or regenerative agriculture, is the way humanity has always farmed – until the last 50 years.

In an agroecological food system, all elements are sourced from nature; think compost, manure, or bokashi instead of chemical fertilizer. Crops and livestock are local, making them better adapted to their respective geographies and more resistant to climate change.

Until the so-called green revolution, this is how food systems had always been. In fact, small rural farmers, fishers, pastoralists, and beekeepers applying traditional knowledge in agriculture, still feed around 70% of the world population – especially among Indigenous People communities. Yes, only urban dwellers get their food from supermarkets. While they account for a third of humanity only, they keep multiplying and requiring more food year-round, hence the necessity to import foods.

The result is a heavy reliance on international food supply chains. A reliance threatened by conflicts like the Russia-Ukraine war, pandemics, and socio-economic problems in producer countries. That is why large donors and bilateral institutions pour money into countries with enough human labor and spare room to produce food intended for their counterparts, usually continents away. Rather than grow their own food, producers in these countries grow crops for exports, with the understanding that their financial gains would enable them to afford food and education. The issue is that the food that is available for them to buy often consists of imports from countries who bought the raw materials from them in the first place. And these imports are subject to price increases due to inflation in richer countries. So the vicious circle persists.

Advocates of agroecology on the other hand, from grassroots movements like the Alliance for Food Sovereignty in Africa to private philanthropic organizations, affirm that investing in local sustainable and self-sufficient food systems is a better solution to food insecurity. It improves resilience in the face of climate change. It protects local biodiversity. It preserves traditional knowledge necessary to maintain balance in these systems. Finally, it upholds the human and land rights of rural and Indigenous farming communities.

The road ahead is still long. Year after year, the United Nations Climate Change Conference (COP) continues to dodge the issue, even though industrialized agriculture is responsible for a third of all greenhouse gas emissions. Unless more voices are heard to influence COP discussions, we will have to make do with carbon trading deals while we hope for food security.

The illegal hunting, spraying, and burning of green spaces is seriously reducing biodiversity

alternative to flower nectar is no longer economically viable due to the devaluation of the Lebanese pound and rising commodity prices. More outlandish solutions from misinformed beekeepers included planting such exotic species as eucalyptus trees to feed bees.

Meanwhile, illegal hunting, spraying, and burning of green spaces is seriously reducing biodiversity. In such unbalanced ecosystems, there are fewer animals, birds, and insects to cull honeybees' natural predators like wasps and hornets.

THE BEE ROAD AHEAD

The main takeaways from above can be summarized as another bullet point in Lebanon's rising food insecurity. A comprehensive analysis of the problem would entail a treatise on botany, zoology, agriculture, sociology, and climate change, but there is neither time nor space here.

The sad reality is that the life of honeybees around the world is growing more precarious by the day. Even as internationally-funded programs continue to position honey production as a means to ensure food security or improve livelihoods through exports, the appeal of beekeeping is dwindling.

If things are left unchecked, the best scenario we can hope for is one where only the most resilient (read: US dollar-backed) beekeepers remain in operation to produce a luxury product: Lebanese honey. This would of course require strict regulations on honeybees' health and honey quality to be able to position this product among global competitors like Yemeni or Manuka honey. For the sake of sustainability, this would ideally require reintroducing the native Syrian honeybee and limiting honeybee and beehive imports, the way Europe is trying to protect its near-extinct black honeybee (Apis mellifera mellifera). Even so, we would only be treating the symptoms of the problem, not its root causes.

Threats to honeybees and to food security cannot be dealt with separately, nor independently of the threat of climate change. In our interconnected world, no place is indefinitely safe from conflict or contamination by disease to the Honeybee, Livestock, Crop, or Man. And even the most adapted and adaptive species – humans included – cannot stave off climate change forever. Worsening climate disasters and extractive industries have brought the stingless honeybee (Melipona beecheii) of Mexico's near-isolated Yucatan Peninsula to the brink of extinction.

The only way to address food security effectively is through the lens of agroecology. This approach involves science, practice, and a social movement, and considers food systems as both social and ecological systems, from production to consumption.

What this means is that Lebanon is not out of the woods yet – not by a long shot. But we can allow ourselves to imagine a coalition of farmers, beekeepers, shepherds, dairy workers, economic and social activists, lawyers, journalists, environmentalists, researchers, and more coming together to discuss solutions. Their perspectives may seem different, but once they understand that these all fall under the same principles that agroecology upholds, perhaps a movement can be born and join global voices to preserve our planet with its previous humans, bees, animals, plants, soils, water, and natural resources.

Alexis Baghdadi is co-founder of the SOILS Permaculture Association – Lebanon, and a communications consultant for agroecology donors and grassroots movements

By Thomas Schellen

THE OFFICIAL TRADE AND SECURITY ANGLE

Mohamed Abu Haidar, General Director at the Ministry of Economy and Trade

Along with other ministries, the Ministry of Economy and Trade (MoET) constitutes the administrative framework of enabling institutions for food security in Lebanon. To understand the MoET's recent initiatives in promotion of agro-food exports, the ministry's strategic approach to food security, and its ongoing activities relating to agro-industrial enterprises and entrepreneurs, Executive sat down with Mohamed Abou Haidar, the general director of economy and trade at the MoET.

E The 2022 edition of a leading European trade show, the SIAL international food exhibition held in Paris in October, included Lebanese participation. Is it correct that you have participated and have been promoting Lebanese agro-food sector exports at this trade show?

Yes

E What is the Ministry of Economy and Trade doing to promote agricultural and agro-industrial exports in this ongoing phase of the Lebanese recovery process?

Besides SIAL, we have also participated in Expo Dubai for six months, and I need to recognize the efforts of the Dubai government who provided the pavilion to us. There were more than 900,000 visitors to the Lebanese pavilion. Among other sectors, (such as IT startups), Expo Dubai was a hub for Lebanese agro-food, especially noting that the Lebanese cuisine is very famous in the GCC countries. At SIAL Paris, Lebanese industrialists organized a Lebanese pavilion in collaboration with NGOs such as René Moawad Foundation and Bieel Fairtrade [Business Innovation and Enhance Export for Lebanon program]. Also in collaboration with the Ministry of Agriculture, and the Ministry of Industry, and the Ministry of Economy and Trade, we provided this pavilion to the Lebanese [food industries] in order to enhance exports to the EU. We did this since we can assure that those agro-industrial products from Lebanon are now up to standards of quality, such as the standards of the Codex Alimentarius (international food standards of the FAO/WHO, ed.) and the Libnor standards. These products of good quality were [at SIAL] and we [organized business to business] meetings for importers and exporters. This is because Lebanese importers can find a different diversity of products, and we believe that competition corrects the price. It is a good opportunity for [importers] to get a diversity of products in very good quality and very good price in order [for import products] to be available to the consumers in Lebanon. So we have two situations, [one] to enhance exports and get fresh dollars into Lebanon, and at the same time [the opportunity] to enhance diversity for Lebanese consumers.

E After the initial collapse of the Lebanese economy over two years ago, the hot topic debated in relation to food imports was substitution of imports by local foodstuffs. Importing opportunities had been getting scarcer because of the implosion of the Lebanese purchasing power and sudden payment obstacles. But when one exports, for example potatoes, the consumers in the country will not be able to eat them. From your perspective, how should we evaluate this relation

of imports, exports, and substitution?

As you know, 86 percent of our food is imported. At the same time, after the crisis, due to the depreciation of the Lebanese currency and the decreasing of purchasing power, most of the [agro-industrialists] in Lebanon are trying to export, in order to recompense for what they may be [supplying at a loss] in our country. They are trying to recompense [their heightened local costs], especially if we take into consideration the high cost of fuel. The direct cost on food is now between 12 and 14 percent - and this is unbelievable.

E ***So out of each LL100,000 that consumers have to pay in the supermarket, there are LL14,000 that go to transport and fuel?***

That's it. Thus the industrialists try to export in order to get the fresh money, in order to import raw materials, and at the same time in order to [retain] the families [and] workers who are still working in their factories and industries. As we know, some of them have left Lebanon.

E ***In talking about ratios of agro-food exports in relation to imports and the promotion of Lebanese exports, were there actually any exporting contracts that were signed between the Lebanese and foreign importers at the SIAL or EXPO time?***

This is a private sector [issue]. We did the B2B meetings for both of them and we left them to do their own business. Our targets are to enhance exports and to promote our products. At the end, the Chambers of Commerce, Association of Lebanese Industrialists, and some syndicates have their own business [dealings] and we do not interfere in these since they are private sector [activities], but provide the hub for them.

E ***Executive has been told that the Ministry of Economy and Trade has requested a multi-year strategy for food security to be developed for Lebanon with the support of the FAO and the European Bank for Reconstruction and Development. What would be the focus points of such a food security strategy for the MoET?***

As you know, after the August 4 blast [in 2020], there are today no silos in Lebanon. This means there is no strategic storage of wheat. The Economy and Trade Minister, Amin Salam, got in touch with the World Bank and we got the approval for a $150 million loan within the food security support framework that you mentioned. This is in order to provide wheat at the proper prices to Lebanese citizens, knowing the Central Bank will no longer be able to subsidize this import. And it seems that during the upcoming days, we will start this program. This is in regard to a major part of food security strategy, especially since the start of the war between Russia and Ukraine. As you know, 80 percent of Lebanese wheat was imported from Ukraine and the rest from Russia. Also the crude [edible] oil also came from Ukraine and Russia. Packaged [edible] oil [was sourced] to 34 percent from Turkey; [however], Turkey was importing the crude oil from Ukraine. Although some of the peak prices of commodity food have since moderated, the cost of [shipping in] vessels has increased and the cost of insurance has increased, so that we were facing a food security problem worldwide, and at the same time locally. But I have to highlight that some industrialists during the crisis had opportunities to start creating new products of high quality that will be available to our population. Regardless of the crisis, I think the agro-food sector and industrialists were in a good and safe situation.

> "The direct cost of fuel on food is now between 12 and 14 percent"

E ***Food security indeed seems to be the topic of the year all around the world. What is the strategy that will address food security in Lebanon beyond the Ukraine crisis and the problems over the availability of wheat?***

The Syndicate of Food Importers and the Association of Industrialists are finding alternatives. For example, during the first weeks and months of the crisis, they went to Croatia, Moldova, Romania, in order to get substitutes. They find solutions. We did not miss out on anything, but it was a matter of price. As you know, in Lebanon, the private sector is importing, not the government.

E ***Is it correct that at the Ministry of Economy and Trade you neither have a budget for import subsidization or for such things as paying for pavilions at international food fairs?***

We were trying to promote exports at EXPO and I have to again thank the Dubai government for their support. At SIAL, the private sector and Fairtrade were supporting us. This is a success

story for the [partnership] between the public sector and the private sector. This is what is most important for all of us. And we have to benefit also from the "triple P" law that was implemented in our Parliament. We need public-private partnerships and this is a success story in which the public and the private sector can do very good things if they work together.

E But was the PPP law from its inception, and also the applications that had been discussed at the CEDRE conference and in other partnership plans before the crisis, not mostly related to infrastructure and transport?

Yes, I know but [my point here] is about the concept of "jumelage", and affiliation between the public and the private sector.

E Is there any specific design for PPPs in, let's say the construction of silos at Beirut or Tripoli port? I know that EBRD did the per-feasibility study for silos at Tripoli port.

I need to tell you that we have two directorates in our ministry, the directorate of economy and trade and the directorate of grains and wheat. This is under the patronage of the other directorate. Frankly speaking, [I have] no idea.

E I have heard that there was a roundtable on food waste in the hospitality sector at the end of September, organized by the Lebanese American University (LAU), in which you participated.

Yes, [this event] was very good.

E Taking a look at the study on food wastage in the hospitality establishments that the roundtable was basing its discussion on showed me that the study's data were collected by LAU researchers prior to the economic crisis.

LAU, AUB, and I announced during the roundtable a new competition for students for developing a proper awareness campaign, a video campaign, for raising awareness among citizens to reduce the waste of food, especially as they mentioned [in the study] that 35 percent of our food was lost.

E My question is actually about changes in food waste ratios since the crisis, and how the shocks on affordability of restaurant meals and access to food in general might have already been impacting behaviors. Given that the underlying data of the study were collected in 2018 and early 2019, wouldn't it be very interesting for public and private stakeholders to gain insights into trends in this area that have emerged since the crisis?

I totally agree. I recommend that you keep in touch with the center of studies at LAU, Dr. Hussain Hassan, and with Dr. Mohammed Abiad at AUB.

E But you at the MoET don't have newer data on this issue?

Frankly speaking, no.

E With regard to the collaboration between the Ministry of Industry, the Ministry of Agriculture, and the Ministry of Economy and Trade, also noting that you mentioned the two directorates that are working at the MoET, and knowing that there are other departments, such as the commission for regulation insurance, that would have a role to play in securing our food sustainability at the country level, is there a standing committee in charge of collaboration, or an established procedure for the coordination between all these public institutions?

I am in good collaboration between the Ministry of Economy and the Ministry of Industry, especially on the level of the [Director Generals] and with the Ministry of Agriculture, and with all public sector [institutions], and also especially

"With regard to food security, everything that is imported could not be in the market unless we get the laboratory test results"

with the Chamber of Commerce when there is any issue regarding food security. We have also to take into consideration that the minister [Salam] is the head of the governmental subcommittee on food security. So he will usually give me the updates and instructions on things that need to be done. At the same time, I am working with my colleagues, the DGs, on this matter and find solutions whenever there is a need.

E For how many years have you served in the role of DG?

Two years.

E And before that, you were overseeing the consumer protection unit at the MoET?

[Consumer] Protection and Quality. I was for five years working with UNDP in the Ministry of Economy and Trade.

E So from your experience, how is the Consumer Protection Unit able to function today when it comes to price supervision and quality of food that is for sale in the Lebanese markets? Some people tell me that they buy food as cheaply as possible but don't always know where it comes from and have had quality issues.

First of all, the Consumer Protection Directorate is working with not more than 60 inspectors, while we have 22,000 mini-shops, 180 supermarkets, and 160 bakeries [to supervise] and [outside of the food retail market] over 4,000 private [electricity] generators and 3,000 gas stations. With regard to food security, everything that is imported could not be in the market unless we get the proper laboratory test results. If it is up to standards, it will be in the market. Before imported food is in the market, it should be cleared, and this is what is happening.

E Can you exclude that gray imports would come in across the land borders, such as smuggling of poultry or tomato products?

We are checking everything. Everything is checked either under the umbrella of the Ministry of Agriculture, Ministry of Public Health, research labs, or the Ministry of Economy and Trade. Regarding the internal products, the Ministry of Industry is doing a good job with the industrial [establishments] in order to organize and supervise their activities. At the same time, the Ministry of Agriculture, also in collaboration with us, is trying to compensate for the lack in our staff. We also addressed a letter to the syndicate of supermarkets in Lebanon and told them not to accept any new Lebanese product that is published for the first time, before informing us and getting the results of the lab tests. Also the Ministry of Industry informed them that they have to obtain the certificate that the company is registered at the Ministry of Industry, in order to avoid those fraud industries.

E I had the opportunity of interviewing the then-Minister of Economy and Trade shortly after the Lebanon Economic Vision, or McKinsey plan, was released a few years ago. In the context of providing the Lebanese producers with guidance on export opportunities and promoting agro-food products abroad, is the McKinsey plan of help to you today?

What happened before 2019, is not 100 percent applicable now. But in the end, in the McKinsey [plan], there is a solid infrastructure regarding high-tech, agro-food, industry; everything was put. For sure, this is very good. We have to take it into consideration and perhaps have to do some fine-tuning about this part. There are also new studies published with the minister in collaboration with ESCWA. I think all those studies need one keyword: execution. They have to be executed.

> "We need public-private partnerships and this is a success story in which the public and the private sector can do very good things if they work together"

E In the international arena, there have been some controversies about the concept of food sovereignty, meaning the need and ability of countries to develop their own local foods and small indigenous agro-cultures, versus the issue of food security, which is sometimes associated with corporate control of agri-business, genetically modified organisms, and dominant roles of multinational groups. What is your personal view on such controversies? Do you prefer for Lebanon to be a champion in food sovereignty or a success in food security?

We need both of them. Since [the country] is trying to move from a rentier business model to a productive business model, I think you first need to secure the security of your population. At the same time, since our raw materials are imported and we are historically importing everything, we need to be exporting, so I think we need both.

The olive is the unassuming heroine among the stone fruits, serving people in the Eastern Mediterranean since Neolithic times as a food source and trading commodity. The beauty of the olive tree and its mystical shine has been sung from antiquity and the olive is a symbol, as well as a sacred and cultural asset.

In partnership with
KONRAD ADENAUER STIFTUNG

Photo Essay

Photos by Marc Fayad
Text by Thomas Schellen

The olive groves in Chabtine which are cultivated and cared for by the local monastery

ON THE VALUE OF LEBANESE OLIVE OIL

Olive trees have their homes around the Mediterranean Sea. Britannica says they are cultivated commercially in two world-spanning climate belts between approximately the 30th and 45th latitudes North and South. Hundreds of varieties have been recorded and are grown for table use and olive oil production. For increased fruit bearing productivity, varieties are subjected to human involvement in their propagation, yet have spread across borders without prejudice of nation or race. Northern olive farmers tell Executive that the number of extant varieties in Lebanon and their ratios per growing region are not known but say the small and resilient local "Airouni" variety coexists in the same groves with Italian and Spanish peers. For our photo essay, Executive photojournalist Marc Fayad visited groves in Chabtine (above), Kfifan, and Kfar Helda in the hills east of Batroun. The operational base of olive oil farmer Rouhana Bassil, who was interviewed for this essay, is in the village of Smar Jbeil.

Many parents involve their school-age children, by treating the orchard as the classroom of life and by telling their offspring that backbreaking work is fun

Seasonal laborers have arrived for the harvest. Women and men work in teams that divide the labor between shaking fruits from the trees, and picking up and bagging the olives from tarpaulins spread out beneath the trees.

Men with harvesting tools – the mechanized shakers seen here – command the higher daily compensation rate of LL400,000 or around $10 a day at the parallel market exchange rate in October/November 2022

Gathering the fruits from the tarpaulin

A harvest season tends to be around two months long per growing region and requires six to seven hours a day of strenuous efforts. According to farmer Bassil, the compensation is between LL350,000 to 400,000 per day during this season.

Leaves, twigs, and fruits are mixed. Could there be room for efficiency gains in the harvesting methodology?

Olives should travel quickly from the field to the press


The sorting of the fruits from the chaff

The post-harvest processing of olives takes place at one of several presses that are distributed around the villages. Presses are commercial operations. Some of the presses in the Batroun district are operated for the sake of the farming communities by non-governmental organizations such as the Rene Moawad Foundation or by monasteries, of which the region is rich. Religious entities also own much of the land cultivated with olive trees, and Bassil says he prefers harvesting from those lands, because the monks care well for their trees and refrain from using pesticides.

Presses do not all employ the latest technology but functional in the second stage of cleaning the fruit before crushing them into a fine mesh that includes stones and fruits.

The mesh is called khouwass and generated by an olive mill that exerts pressures of 200 tons. It is spread out mechanically on a mat (above). During the oil extraction preparation stage, the khouwass is traditionally layered into makbass towers of mesh sitting on round mats (top right).

This steady stream of olive oil still contains residues in varying shares. The first oil that is extracted from the mahbass without prior additions of chemicals or without heating might be marketed as extra virgin once it arrives in a gourmet store, but as it runs into a water-filled basin used for separation of oil and residues, labels such as virgin and extra virgin are just marketing mumbo jumbo. Nonetheless, cold pressed and organically produced oil is liquid health with low-carbohydrate, high-monounsaturated fat content and anti-inflammatory and anti-oxidant properties.

Modern equipment is good for the production of quality oil and used by farmer Bassil in his own workshop for further refinement of the oil that comes from the presses. Bassil bought Italian-made machinery made from stainless steel, which he says lasts for “a very long time.” He regards it as more reliable than domestically manufactured equipment and uses his equipment to reduce the residue content of his oil by a further 500 grams per 16-liter batch, before it is ready for sale. Bassil’s family has been in the business for more than 30 years, and he retains a personal, religiously informed perspective on the value of the olive tree and its fruit. “Jesus prayed in the olive grove, and one of our rituals as Christians on the feast of Shaanine is to hold olive branches. This makes me feel that this tree is God’s great blessing and I love it.”

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SPECIAL REPORT

FOOD INFRASTRUCTURE AND INNOVATION

> Infamous infrastructures and the multiple barriers
> Are the hunger games behind us? How state absence is leaving farmers to foreign donors
> Agro-humanitarian distribution and implanting a long-term system
> Academia and industry: two different languages
> The new policies needed to wean Lebanon off imports

In partnership with the Embassy of the Kingdom of The Netherlands in Lebanon

Kingdom of the Netherlands

By Thomas Schellen

Infamous infrastructures

The need for conquering multiple barriers

The future of farming will involve escalations of aquaculture and urban farming. These are ancient forms of food cultivation that are or can be decoupled from soil. As such, they have become increasingly viable and important in a world that has limited resources, while it is populated by billions of humans, in addition to the gazillions of micro-organisms that have always been around as the vast and silent majority of life species. Yet, from the limited perspective of the contemporary human specimen, we still associate the bulk of food production with soil-based cultivation. In this sense, one can think of land as the ultimate infrastructure of agriculture, the prefix "infra" meaning that what is beneath.

However, for our human ability to feed ourselves in the billions, rich soil that is able to guarantee subsistence to those who work it does not suffice as agricultural infrastructure (otherwise Lebanon with its soil and accommodating climate and microclimate situation would be one of the most food-secure areas on the planet). Agriculture in the 21st century involves and depends on a range of interconnected infrastructures, hard ones and soft ones, or in broad terms, on systems for the economic and sustainable production of food as physical and mental assets.

The overriding problem of agricultural infrastructure in Lebanon is the impact of the economic and social crisis in its manifestations of power cuts and water supply shortages. This combination of high cost and insufficiency in the most basic supplies is as debilitating as it is obvious for households, but it is also extremely bad for agriculture. This is because demand increases and supply bottlenecks for water, energy, and food

can translate into destructive synergies where high demand for energy – a top resource needed in food production – and high demand for water, also a leading input – endanger food supplies and make food prices balloon.

High demand for food likewise can translate into price increases of water and energy, in a triangle of interdependence where agriculture and food production gobble up water and energy (according to some reports to the tune of 69 percent of global fresh water consumption and 30 percent of global energy consumption). At the same time, energy production requires massive water inputs, and some forms of water production are highly energy-intensive.

Not accounting and strategizing for what is known as the Water, Energy and Food Security (WEF) Nexus exacerbates the interconnectedness of water, energy and food production and can transpire as a fateful cycle of negative interdependence. In Lebanon's case, understanding the WEF Nexus gives us the reason why the economic shocks of power cuts and the high cost and low availability of water translate into problems with food security. And that is even without mentioning other cost boosters, such as the suboptimal means of transportation and bad roads.

DELIVERING FOOD TO THE MARKETS

Getting food to the people in a market economy requires logistics and the expense of transportation costs. Spiking fuel costs are reportedly responsible for more than 12 percent of product prices on supermarket shelves (see interview with the director general at the Ministry of Economy and Trade in Executive's special report on Food Security in Lebanon). But the transportation infrastructure dilemma is not only domestic, nor is it limited to a function of the fuel price shock that was generated by the withdrawal of socially and economically detrimental fuel subsidies.

The transportation problem for export-seeking agricultural and agro-industrial producers has historically extended to underperforming export infrastructures, most notably the vital port operations. Since 2000, container terminal construction and its development under a private operator at the port of Beirut actually was improving incrementally to a level of comparatively high performance, until the 2020 catastrophe of the port blast.

Although the blast did not impact the container terminal as badly as other portions, while a partial recovery of the container handling capacity was achieved within days and expanded over the following months, the loss of capacity was immense. This relative added cost burden on exporters, many of whom are agricultural and agro-industrial producers, has actually recently been measured in the performance rankings of container ports around the world.

A comparison of the World Bank affiliated Container Port Performance Index (CPPI), which covered over 350 large, medium, and small container ports, the port of Beirut's CPPI position in the inaugural report of 2020 was very respectable, by a metric called administrative performance that saw Beirut in 66th place worldwide. Under a second, and perhaps even more relevant metric of statistical performance, Beirut's container terminal even ranked near the top of the world – in 11th place out of 351 measured ports.

> Energy production requires massive water inputs, and some forms of water production are highly energy-intensive

That, however, is history. In the 2021 CPPI, which was released earlier this year and is based on performance values in the year 2020, Beirut's position collapsed to 356 out of 370. Some ports in North America and Africa performed worse – the Los Angeles and Long Beach port pair were the worst of all container terminals due to pandemic-related disruptions; reasons for the bottom performances of several major African ports were alleged by African and international media to point towards corruption.

But the blast-hit Beirut port was the worst performing container operation in the Europe and Mediterranean region for the whole year. The CPPI ranking of Tripoli port, classified as a small operation by global throughput versus Beirut port's medium size, also deteriorated but by a much smaller margin, slipping from positions in the 60s and 70s, to positions in the 90s.

The performance of a container port is a major influence on the cost of shipping. This means that agricultural exporters in developing countries will see their international competitive positions suffer because of bureaucratic hurdles, and worsen further if the infrastructure in their main national ports is enmeshed in corruption.

Problems of corruption and bureaucracy were obviously not the factors that devastated Beirut's container handling performance in 2020. But one has to assume that the steep slide in performance did add to the other cost drivers that agriculture and agro-industry has had to cope with; impedi-

ments that will persist over the term of several years, even if the CPPI performance values of Beirut port in the coming years will not remain as depressed as they were in 2020.

THE GRANULAR PICTURE

In the emerging post-crisis economy of Lebanon, one can also detect improvements of agricultural infrastructures. Springing up as renewable energy installations in rural areas, these improvements appear as evidence of agriculturalists' coping practices in the short term but more importantly, they are promising with regard to the long-term sustainability transition of the sector. Renewable energy deployment, a prime requirement under a constructive strategy for taming the WEF Nexus and a core need for better management of climate risks in the decades to come, has in the past two years not been happening under governmental master-plans. Renewable energy matters existed before the economic crisis, but were aborted and for now can be judged with skepticism until they are fully and finally implemented. The overwhelming visual evidence can be seen during any excursions into rural Lebanon in the form of new solar photovoltaic (PV) installations and even the occasional wind turbine.

Moreover, renewable energy statistics by the Lebanese Center for Energy Conservation (LCEC) – a rare institution in that it has maintained a high profile of awareness building and apparent transparency – show that the increase in deployment of solar PV capacities in the past year has been the strongest in the agricultural sector, when compared to industrial, commercial, and residential sector deployments. Accounting for 17 percent of last year's added total solar PV capacity, the agricultural sector leapt, according to the latest LCEC State of Solar report, from 10.33 to 15.57 megawatts peak.

New solar PV installations were implemented in all sectors, to an extent of an estimated increase – from the 100 megawatts that had been implemented in all of the preceding decade – by over 100 percent in 18 months from the beginning of 2021. This increase in renewable energy capacities happened with such speed because of the pressures of a vanishing state electricity supply. In the agricultural sector, informality is considered to be the highest among all economic sectors, and exceeds 80 percent. This could be interpreted as an example of the agro-sector need to replace Electricite du Liban's power supply, which has led to renewable

Renewable energy matters existed before the economic crisis, but were aborted

energy capacities being installed even beyond the measurable context of the formal economy, though not always in line with highest standards nor top efficiencies in solar electricity generation.

Such vagaries pale, however, against the certainty that in the past two years a litany of promises for an improved state supply turned out to be hot air. Public sector promises have lost every last ounce of credibility and the economic pressure of having to replace the absent supply seems here to stay, giving reason to think that decentralized renewable energy in rural economic use will grow stronger in the future. For the recklessly daring, there can be the additional hope that Lebanon, as a renewable energy republic, can achieve further dramatic improvements when utility-scale solar farms are finally realized, which would allow the impoverished population such luxuries as widespread usage of fridges and electric lighting, while simultaneously the country would be delivering on its Nationally Determined Contributions to climate risk mitigation under the United Nation's COP framework.

While nurturing such dreams, the positive renewable energy perspective still cannot detract from the shadier reality that the problems of agro-food sector infrastructure do not end with transportation, export systems, and WEF Nexus problems that have been amplified during the past three years. There are also problems with hard infrastructures specifically for the agro-food sector. For example, deficiencies in the supply of cold storage facilities and lack of sophisticated agricultural equipment for harvesting and transporting

crops at maximum levels of efficiency and quality preservation. This deficiency, according to farmers and agro-experts, impairs values of anything that is grown from bananas and citrus fruit in the lowlands, to apples and cherries that thrive, against an international comparison, at high elevations.

Stakeholders in the agro-food sector further testify to inefficiency, inactivity, and undersupply when it comes to testing labs and research facilities. Likewise, on the supply end of the food value chain, seed banks and nurseries need to be developed much further. In the matter of the most needed and potentially most useful agro-industrial infrastructure, special economic zones for agro-industry or any other manufacturing industry can be spotted in the Bekaa valley. And, to name just two examples of downstream holes in the food value chain, the producers on the farms are forced to contend with a systemic lack of fair and efficient market organization, at the level of distribution and wholesale.

This entire anti-system of dysfunctional infrastructures, which in soft infrastructures also includes paucity of vocational training, lack of insurance, historical under-investment and since the economic crisis completely insufficient access to capital, is too vast and too fragmented to be the result of some powerful conspiracy. The anti-system also is far too deeply entrenched to have been produced by the economic crisis of the past three years – which, by the way, had the ambiguous function of exacerbating the woes of agriculturalists and agro-industrialists, but at the same time opening new economic opportunities to agile stakeholders in the agro-food sector.

DIGGING UP THE GDP EVIDENCE

Short-term comparisons of agricultural export data between 2019 and 2021 show strong increases when seen through the lens of an internationally funded initiative called Business Innovation and Enhance Exports for Lebanon (BIEEL). Predicting an expansion of agro-food exports of products "in BIEEL scope" – covering live animals and animal products, vegetable products, prepared foodstuffs, beverages and tobacco, and animal or vegetable fats and oils – by $50 million at the end of 2023 in comparison to a 2019 baseline, the initiative said that exports in these four categories showed an improvement of $387 million: from $627 million in 2019 to $1.01 billion in 2021, a 62 percent increase.

However, BIEEL conceded that exports in the category of prepared foodstuffs experienced a juxtaposition of decrease in volume and increase in value. It also acknowledged that export achievements to EU markets have been limited by qualitative and quantitative restrictions and noted that 50 percent in agro-food exports in 2019 went to a total of seven countries, four of which are in the Gulf region and two in the Mashriq, with the geographic destination outlier being the United States.

While promising as indications of agro-food export potentials, such short-term numbers may be questionable from sustainability and data integrity angles. They also reveal little to nothing on the background and role of infrastructures in the sector's efficient and sustainable performance of churning out agro-food products and delivering them to domestic and international markets.

Digging into the history of the Lebanese pre-conflict, conflict, and contemporary post-conflict economy uncovers how the present weakness of dedicated agricultural infrastructures appears to have been caused by the preoccupations with the development of mercantile services, especially financial intermediation. This is the known mindset of the post-conflict period of the 1990s which has lingered since reconstruction, and illuminates but does not explain the degree of attention that was withheld from the agriculture sector. This disregard for real economy can be traced through things such as budget allocations, investments, and the contribution of agriculture to the GDP.

Stakeholders further testify to inefficiency, inactivity, and undersupply when it comes to testing labs

The contribution of agriculture to Lebanese GDP shows a somewhat counterintuitive trajectory for a country that is part of the global south. The trajectory seems more congruent with a small and ambitious services-driven economy that has somehow not succeeded to break into the top ranks of upper middle-income countries. But perhaps the fluctuations in the Lebanese Gross National Agricultural Product (GNAP), as displayed in a paper authored by Riad Saade, the founding president of the Centre De Recherches et d'Etudes Agricoles Libanais (CREAL), have to be seen firstly in the context of a country that was at an epicenter of regional and geopolitical tensions during the Cold War, while also being situated in a bridge position between overdeveloped Europe, struggling Africa, and rapidly developing Arabia.

CREAL numbers say that between 1962 and 1966, the GNAP of Lebanon increased by 48 per-

cent. This was during a period when agricultural productivity in developed countries was progressing by scientific leaps and bounds, due to the introduction of new farming techniques and high-yield crop varieties (wheat, rice, maize, and others). But shortly thereafter, at the time when crop yield transformations along with corporate dominance over agriculture were spreading from developed countries to emerging markets in the late 1960s, Lebanon seems to have experienced a phase of stagnation or stabilization. For several years before the outbreak of internal conflict in the mid-1970s, Lebanese GNAP remained approximately at the 1966 level.

From the mid-1970s, during Lebanon's cantonization over 15 years of externally induced, internal conflict, the contribution of agriculture to GDP seems to have reached output levels never seen before or after. But in the waning years of the Lebanese conflict, GNAP crashed in 1988, leading Saade to conclude in his writings that destruction of the agricultural sector was taking place during the war. Indeed, a comparison of GNAP in 1988 against 1976 shows a significant drop, despite the peaks of the intervening years when agro output appears to have been easily twice that seen in 2002 or 2004.

The GNAP performance in the post-conflict decades has been fluctuating, with agricultural performance perhaps being in line with the volatility of GDP growth for the country overall. There was a relative peak in GNAP in the first part of 2010s, a crash in 2020, and a chaotic situation thereafter. The post-conflict period saw a country with population growth that was below that of many other emerging markets, especially that of large neighbors such as Egypt, Yemen, Syria, and Iraq. Against this subdued demographic development, Lebanese agriculture approached a societal position emulating those seen in developed markets, but without the very high agro-food sector productivity gains seen in Western Europe. In summary, agriculture was clearly playing a lesser and lesser role in the priority lists of Lebanese political and economic decision makers when compared to services and financial intermediation.

> Agriculture was clearly playing a lesser and lesser role in the priority lists of Lebanese political decision makers

The state's relative disinterest in the achievement of agricultural productivity increases apparently affected both agriculture and agro-industry, which aligns with the narrative that all manufacturing industry during the post-war years was handicapped by increasing comparative disadvantages when compared to peer countries. On top of internal and regional economic and policy competitiveness impediments of all industries, the public administration and institutional integrity of Lebanon were sinking into patterns which were increasingly bad for doing business.

Corruption either had been present since Ottoman Empire days or crept in during the late 1960s, followed by bad institution building and bureaucratization, which in turn preceded the total absence of effective public administrative power from the agro-food sector in the 1970s and 80s, and into the 90s. "Since 1992, the launching year of Lebanon's reconstruction, and until today, in 2021, the Lebanese agriculture has been literally ignored by the state of Lebanon and even considered as unnecessary by certain political currents," Saade opined last year.

According to his more recent introduction to CREAL's report for agricultural production in 2021, last year saw farm gate prices influenced adversely as well as advantageously by factors ranging from good harvests in Lebanon to a crop crisis in Syria

which restricted outflows of produce to Lebanon. The combination of "random export markets" and demand conditions that were "shamefully exploited by the domestic wholesale markets" increased the sector's fragility, Saade lamented.

Although the value of crops in agriculture improved by 19 percent between 2020 and 2021, they remained, according to CREAL, below the valuations achieved in 2017, '18, and '19. On the side of animal husbandry, the results in 2021 remained on a worsening trajectory, with a 35 percent loss over 2020 and a halving when compared to 2019. "This affected all sectors from poultry to cattle, sheep and goats. Only beekeeping benefited from an exceptional year in 2021, confirming the economic and biological importance of this production," the organization's yearly report on Lebanese Agriculture for 2021 said. In terms of total value of production in crops and animals last year, it stated a contraction of 8 percent and a continuing downward trend.

A GOOD PERCENTAGE?

It is anyone's guess if agriculture will rise in the wake of the economic crisis to contribute more than the current 3.1 percent to the Lebanese economy – which must be assumed to have a very significant margin of uncertainty due to the informality in the sector. It is also anyone's assumption what would be an optimal level of agricultural GDP for this country with all its historic and current contradictions and peculiarities.

There are 183 countries for which official but not necessarily perfect data for the role of agriculture in GDP – given the intrinsic weakness of the GDP gauge and the substantial presence of informality in agriculture that exists not just in Lebanon – is easily available. Among these 183 countries, the average contribution of agriculture to GDP is 9.9 percent (world average) and the median value, with half of the countries above and half below, is 6.4 to 6.5 percent.

Developed countries – whose populations may have suffered in their cultural integrities more than recognized in their decoupling from their agrarian and pastoral roots – are mostly in the approximate third of countries that show below 1 percent of agricultural contributions to GDPs. Some of the countries that achieve between 10 and 60 percent of GDP through agriculture, are tragically unable to feed and give decent livelihoods to all their people. Could there be a sweet GNAP spot, perhaps located somewhere between the global median and average rate for the ratio of agriculture to GDP?

The questions and collective human survival challenges that underlie the quagmire of what an optimal agricultural contribution to GDP might be, are related to the latter two-thirds of the word "agriculture". Societies have to define what structures they want to exist in, and how far the "culture of the field" should take precedence over patterns of behavior that are detached from the land through a breakdown of societal communication in traps of digital anonymity, and the embrace of virtual dreamscapes fraught with dangers of isolating people from their social contracts and existences. All the while, globalized man is still caught up in old blind races for economic growth in industrial and also agricultural outputs which have contributed massively to the need for 21st century climate action and correction attempts.

Irrespective of the many infrastructure barriers that exist, the agricultural and agro-industrial landscape of Lebanon has been marked from the beginning of the crisis years with entrepreneurial energies (an energy that is not subject to the WEF Nexus dilemma) in well-established agro-industrial minds and a vibrant start-up scene concentrated in highly visible innovation centers that have been supported by international networks, away from dependency on the whims of corrupt bureaucracies, dysfunctional institutions and an impotent state. How innovative agriculturalists, agro-industrialists, and vibrant entrepreneurial startups will prevail against rising global challenges is impossible to predict.

Societies have to define what structures they want to exist in, and how far the "culture of the field" should take precedence

But even if they evade climate disaster, corruption and systemic perils, a wide-ranging infrastructure reboot is a change that has to come. This departure from the old system has to involve the state as a stakeholder and large international enterprises and accountable state-owned enterprises, and joint venture companies in the construction of strategic infrastructure assets from utility-scale renewable energy plants and strategic new grain silos, to distinct facilities such as functioning labs and affordable warehousing of harvests. It is the move from the infamy of an infrastructure that consists of nothing but gaps, to one that can carry agricultural production and reduce unnecessary losses of food.

By Sarah Hourany

LEBANON: ARE THE HUNGER GAMES BEHIND US?

Government absence is placing farmers and agro-industrialists in the hands of foreign donors

Food insecurity is at the forefront of global threats and its prevalence is intensifying. An estimated 54.5 million people are severely food-insecure in the Eastern Mediterranean region as a result of the impact of the Covid-19 pandemic, according to the World Food Programme. In Lebanon, a combination of economic, political, health and social factors are deterring the country's ability to combat hunger risks. While the financial downturn has had an exorbitant impact on the daily lives of citizens and business, the country's existing agriculture infrastructure was already calling out for greater attention, with too much dependence on foreign aid, organizations, and United Nations (UN) agencies. The situation has become even more challenging for a country hosting approximately 1.5 million Palestinian and Syrian refugees, adding further pressure to fragile socio-economic conditions.

The UN's Food and Agriculture Organization (FAO) points out that food security encompasses four components: availability, meaning the supply of food in an area; access, including the physical and economic ability of people to obtain food; utilization, in the sense of proper consumption of food; and stability, which refers to the sustainability of food production and supply. But where does Lebanon really stand?

AGRICULTURE: A STRATEGIC SECTOR NEGLECTED FOR DECADES

The great famine of Mount Lebanon between 1915 and 1918 pushed policy makers at that time to add the predominantly agricultural areas of Akkar, the Bekaa Valley, and South Lebanon, over to Mount Lebanon to ensure that the latter is not susceptible to hunger again.

For agricultural engineer Hanna Mikhael, successive governments from 1992 onwards failed to address agriculture in the same context as other productive sectors, he tells Executive. "With the limited budget allocated for the Ministry of Agriculture, the sector has been adopting a "begging" policy, counting on the non-sustainable financial support of the UN's Food and Agriculture Organi-

zation, World Bank and non-governmental organizations (NGOs) rather than on a long-term national strategy," Mikhael says, who also co-founded Izraa, a Facebook page providing agricultural and technical advice to 139,000 members.

The losses incurred in 2020 when Lebanon's grain silos at Beirut's port were pulverized by a deadly blast, and the outbreak of war in Ukraine, exerted additional pressure on the country's wheat reserves. Mikhael advocates for the decentralization of grain silos to mitigate such risks. He also requests from municipalities and religious authorities to offer the vast areas of unutilized land that they possess to increase grain production.

Agricultural economist Souhad Abou Zaki considers that increasing the local production of wheat and pulses is possible; if targeted, well-communicated, and timely subsidies are provided to give financial incentives to farmers to produce them, she tells Executive. While this would improve the local food safety status, it will not by itself ensure food sufficiency. According to Mikhael, the decades-long absence of an efficiently implemented agricultural strategy has exacerbated the sector's fall amidst the crisis: "Ironically, the Ministry of Agriculture's NAS [National Agriculture Strategy] for 2020-2025 is a replication of the previous two strategies of which almost no achievements were recorded."

First and foremost, the failed energy sector has been severely harming agro-industry. Long before the crisis, the sector suffered from recurrent electricity outages, and this has worsened in the last two years. "In terms of fuel, the global increase in prices combined with the rapid devaluation of the local currency and removal of subsidies led to a sharp surge from $2.64-3 per liter (at a rate of $1,507/LL1,000) in the late 1990s, to around $20-22 per liter at the exchange rate on the parallel market. This sharp increase added additional pressures on farmers and increased the cost of transportation of agricultural and food products," Abou Zaki says. The irregular supply of energy places the sector at risk, given that power is a key input in all stages of agriculture, from production (equipment, machinery, water pumping), to grading, storage, packaging, transportation, and selling.

The state of water supply and networks, which are essential for irrigation, are not much better. "The vast majority of small-scale farmers use traditional irrigation systems which leads to inefficiencies and waste," Abou Zaki says, before adding that water pollution and contamination emanating from inadequate water pipes and sewage draining have significantly affected soil properties and quality. "Not only production losses are probable, but the productivity, quality, and safety of the locally consumed products are at risk," she says.

Road facilities play a significant role in the improvement of agricultural production, but with the lack of proper maintenance, costs and losses certainly increase. Abou Zaki considers that the post-harvest infrastructure, practices, and management are weak and way below international standards. For instance, wholesale markets are not organized or monitored, which generates large amounts of food waste. "Adequate agricultural storage facilities are either limited or very costly to rent. A significant number of small-scale farmers and agricultural cooperatives rely on assistance from local or international NGOs to invest in infrastructure (greenhouses, machines walls, irrigation) given their inability to secure funds from their own limited profits, nonetheless this support may not be always sufficient or suitable," she adds.

According to Mikhael, the decades-long absence of an efficiently implemented agricultural strategy has exacerbated the sector's fall amidst the crisis

The deteriorating situation of farmers, the sector's human capital, should not go unnoticed either. "Feed materials, grains, pesticides, fertilizers, and other agricultural inputs are purchased in US dollars while the farmers are selling in local currency, making them vulnerable to the constant currency fluctuations. To make matters worse, farmers are rarely compensated when their harvests are lost due to bad weather conditions," Mikhael says. This requires the establishment of emergency funds for farmers and agribusinesses in the event of crop, livestock, or even physical infrastructure losses due to climate change or natural disasters, as per Abou Zaki. Besides, the rental prices of lands have surged. "Rethinking land-related laws such as ownership, land transfer, inheritance, and registration to resolve conflicts over land ownership and incentivize investment in the land and agricultural infrastructure is a major recommendation," Abou Zaki says. These worsening conditions will not push farmers out of the sector, as most of them are occupationally immobile. But it will impact agricultural production and negatively affect the country's food security position, according to Mikhael.

THE INDUSTRY SECTOR: PRIVATE INITIATIVES ENSURE PRODUCTION VIABILITY

With the devaluation of the Lebanese pound, the Ministry of Industry's budget has become negligible and is barely covering the institution's operating costs, the advisor to the caretaker Industry Minister, Adib Dib tells Executive. The sector is therefore counting on foreign aid, but this is either getting reduced or suspended due to the political impasse across government. A solar energy project with the United States Agency for International Development (USAID) has not materialized and another industrial cities' project with the UN Industrial Development Organization has been halted, he says. Besides, the road conditions have been deteriorating, with Zahle's industrial city being a striking example of such decaying infrastructure. While the Ministry of Public Works and Transport is responsible for highways, internal roads are the municipalities' responsibilities. But again, the accumulated revenues of the latter have lost 90 percent of their value, as per Dib. "The ministry is exerting enormous efforts to improve the infrastructure state of Lebanese factories, but it doesn't possess a magic wand," Dib says, before elaborating that despite protectionist policies adopted to improve local production, external local and regional conditions are creating challenges.

Nicolas Abou Faysal, President of the Association of Bekaa Industrialists, shares a more positive outlook for the industrial sector. "The rate of LL1,500 to the dollar era was an illusion and therefore our GDP was overestimated. Today, the incurred costs are real, but our production is real too," Abou Faysal tells Executive. He expects the balance of trade deficit to gradually shrink over the next five years and says that there are no major food security risks in Lebanon. The sector is currently booming with over 15 new factories built in the last two years in Zahle, providing high-quality products which are replacing imported ones. On the infrastructure level, Abou Faysal explains that the industrialists adapted to the changing conditions by resorting to solar systems to ensure a consistent source of energy and by installing or enhancing their water purification systems. The decaying road conditions, for Abou Faysal, are not new and therefore do not constitute a factor harming production. Yet, the pan-Arab highway project signed in 2003 and not yet finalized could give a boost to local production.

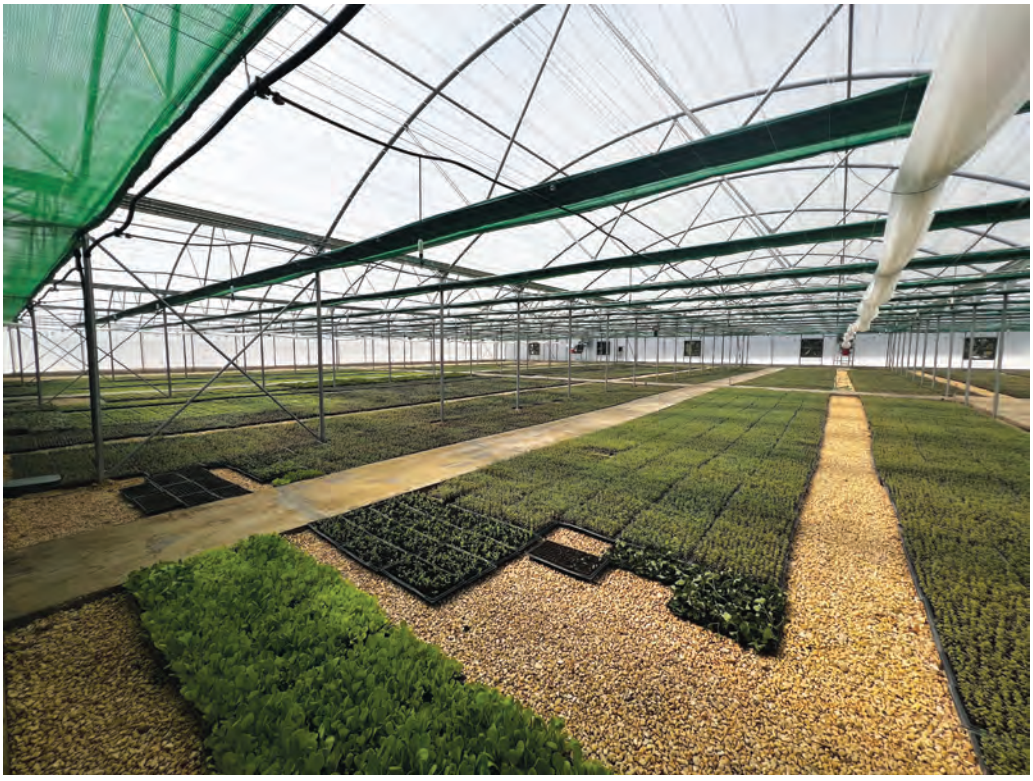
To minimize corruption, especially on the customs level, Abou Faysal proposes strengthening the roles of economic attaches at Lebanese embassies abroad, by giving them the authority to verify and approve shipments being exported to Lebanon. This will reduce the risk of fraudulent customs declarations and protect local producers. The establishment of a special economic zone in Zahle, conducive to investments, is also vital to increase the number of local food production companies, Abou Faysal says. A similar plan for Tripoli was approved in 2008. The plan was finalized and the funds were secured in 2018, but the government failed to approve its development, as per a statement by Hassan Dennaoui, acting chair and general manager of the Tripoli Special Economic Zone.

> The irregular supply of energy places the sector at risk, given that power is a key input in all stages of agriculture, from production to grading or storage

Overall, and across the agricultural and industrial sectors, private initiatives and donors' support have kept production ongoing. The latest Ease of Doing Business Index issued by the World Bank ranked Lebanon 143rd out of 190 countries, reflecting a rather weak position on many levels, including infrastructure, which can hinder much-needed investments. If no strategies are put in place, Lebanon's competitiveness will be further weakened, at a time when the global economy's future is looking mixed to say the least.

By Thomas Schellen

TARGETING THE RESILIENCE FACTOR



From agro-humanitarian distribution to implantation of a sustainable system

Investing into an agricultural stock or an agricultural infrastructure system is intensely unlike dreaming of instant financial gratification, for example by becoming a financial markets jock. Imagine being a day trader on multiple stock exchanges or feeling the hourly thrills of seeing your crypto-wallet bursting at its virtual seams with a million dollars or three, made (and lost) in speculative bets on Bitcoin, Ether, Tether, et al.

Now shudder and think about agricultural stocks, from publicly listed farming cooperatives to fertilizer and equipment multinationals. Investments can be rewarding and seem rather safe – agriculture and its distant cousin of consumer staples are among the prime defensive sectors in the terminology of stock markets – but come with agrarian risks and reward profiles. This path to prosperity is staid and slow by the nature of agriculture as a business.

The only investments guaranteed to keep your heartbeat safer from rapid increases and undue exhilaration than stock portfolios in agriculture, would be investments into agricultural infrastructure and systems. Returns of a direct investment into an agro-system are many growing and harvesting seasons away. In financial terms, neither are investments into publicly traded agricultural corporations as addictive as playing the conventional or virtual financial markets, nor are returns on direct investments into agricultural infrastructures and privately held agricultural enterprises, typically as high as those in tech and healthcare companies. At least during boom times.

Yet, the world is not living in boom times anymore, and it is a sign of these recessionary times that the value of the agro-production system and agro-food economic sector is going through the roof. Add in the importance of being able to dif-

ferentiate between value and price, and while you are at it, also rethink and recalibrate your profit orientation by pricing in previously ignored, value-annihilating externalities.

Noting that the distinction between value and price has been demonstrated most impressively in Lebanon's recent but already legendary economic and monetary crisis, you may arrive at the point of reappraising your entire framework and mind-set of productive investment into the real economy in the context of agriculture and livelihoods in rural Lebanon.

AN OVERDUE DEVELOPMENT ORDER

Against the background of global and local crises in the 2020s, the need to develop Lebanon's agriculture-based economic ecosystem – with its incomplete and dilapidated infrastructures – is dire. Not only have public and private investments into this system over decades been too small by orders of magnitude, but new development projects also face limitations in size, economies of scale and short-term return potential, along with barriers to funding, planning and management capacities, and community acceptance. Thus, equipping rural farmers with an incentive-rich agro-food production system that will encourage them to continue producing and tending the land, while also contributing to the establishment of rural business opportunities, is a tall order indeed. Such a quest needs "time, trust, and lots of effort," socio-economist and agricultural livelihoods expert Elias Ghadban notes.

Ghadban is involved with the design and supervision of one such development program that is currently being undertaken not by a for-profit corporation or public sector entity, but by a charitable organization, the Order of Malta in Lebanon (OML), under what resembles a public-private-community partnership, or civil society, community, and public partnership. Ghadban speaks to Executive as technical advisor and volunteer board member of an agro-humanitarian program that was initiated at the cusp of the Lebanese crisis by OML, a unit in the 900-year-old Sovereign Military Hospitaller Order of Saint John of Jerusalem, of Rhodes and of Malta.

The agro-humanitarian program of OML started with a small project that the organization initiated soon after Lebanon's commercial banking channels were paralyzed early on in the financial and economic crisis, which brought down a system of rural credit between suppliers and farmers. Under the hitherto functioning system, farmers would obtain seedlings at planting time from commercial providers and pay for them several months later out of revenues generated from their harvests.

> The conditions during the financial crisis left farmers with the sole option to pay for seedlings with hard cash-on-hand

The conditions during the financial crisis left farmers with the sole option to pay for seedlings with hard cash-on-hand. In this livelihood emergency, the agro-humanitarian project endeavored to provide small-hold and part-time farmers with inputs – seedling – that had become impossible for these farmers to obtain. From this point of origin, transforming rural livelihoods has become the gist of OML's agricultural approach.

Under its initial agro-humanitarian thrust, OML has been providing a stopgap answer to this problem through the distribution of seedlings that allowed more than 8,600 farmers to plant enough crops to secure subsistence nutrition for their families and additionally achieve some supplemental income from selling part of their crops. Five vulnerability assessments were undertaken to identify the eligible farmers. "We said that we will target the

OML AGRO-HUMANITARIAN PROJECT

Duration 2020 - 2022

Rural beneficiaries between 1.1.2020 and 10.31.2022	8,657
Number of seedlings distributed	11.6 million
Land planted partially or fully with OML-distributed seedlings	710 hectares
Average size of supported agricultural production area per farm	0.2 hectares
Working days of short-term rural labor created	36,000

(of which 32 percent female labor share, farmers had committed to refraining from usage of child labor)

farmers that are linked to the primary healthcare center in the catchment area of each center [and], working next to the center in close collaboration, will support farmers with seedlings depending on summer or winter season, with organic matter, and irrigation systems," Ghadban explains.

According to him and his colleague Adel Ghandour, who manages the OML agricultural services team, more than 11 million seedlings with an aggregate value of $370,000 were distributed between 2020 and the third quarter in 2022. This represents 43 percent of the target clientele of 20,000 farmers that the charity aims to reach by 2025.

The 2025 target is based on an extensive network for OML services provision which includes mobile units, supported centers, and proprietary centers. Catchment areas of services centers are extensive and provide the base for the organization's agricultural support nodes called Services Provision Units (SPUs). Five of these units have been developed to date, out of a targeted total of seven that are to be built on 130,000 square meters (sqm) of land, according to a fact sheet provided by OML.

This distribution model, however, is not a long-term solution. "Because the context has changed, we are moving from the humanitarian distribution, to [targeting] a resilience factor where you support the farmers to continue [farming] but also create economic opportunities in rural areas," Ghadban explains. In practical terms, this means that the agro-humanitarian project is advancing into its second and third phase, which entails further training and community development efforts. But the project is anchored by horticultural nurseries in a communal operation, and by to-be-implemented processing units for the key crops at SPUs co-located with OML operated or supported centers, found from Kobayat and Ras Baalbek in the north, to Yaroun and Rmeich in the south.

The horticultural nurseries, include a batch of operating nurseries which have to date produced over 2 million seedlings. By the first quarter of 2023, the number of nurseries will be eight, each with projected capacity of around 7 million seedlings per year. "This satisfies around 15 percent of demand, which is significant for us, because this is a pilot project," Ghadban says. According to him, the first batch of nurseries already provides seedlings at comparable or better quality than those offered in the commercial market, at a price to farmers that is lower by 40 percent when compared with the for-profit market.

They are complemented by crop processing units with equipment for roasting freekeh, or young wheat, and presses for oils and essences. Of the processing units, a pilot freekeh facility has become operational in Yaroun. The investment budget for creation of processing units has been put at $250,000 to $300,000 per SPU and a consultative evaluation of further processing unit establishments between OML and farming stakeholders has been initiated. However, such collaborative decision making is a time-consuming undertaking, Ghadban explains. Both components in the food value chain, the nurseries on the upstream side and the processing units in the post-harvest realm, will operate on basis of a resilience principle by offering their services to farmers at break-even prices, he adds.

According to Ghadban, the program was initially devised as a small initiative under the accessibility pillar in the food security matrix

The fact sheet on the OML agro-humanitarian program says that it was launched in 2020, "establishing the beginning of the Association's involvement in agriculture, after 60 years of presence in the country through its network of community health centers." According to Ghadban, the program was initially devised as a small initiative under the accessibility pillar in the food security matrix and was called agro-humanitarian because it was created in response to a humanitarian crisis in access to food in Lebanon.

From the program's emergence early in the crisis, it is not entirely clear if OML's venturing into

agricultural system building came into existence in the form of a sound instinctual reaction to the crisis or had a strategic aim from the start, but the key to the entire project is a deep-rooted and long-planning relationship. In developing its SPUs, OML built on both its track record as an operator of primary health care centers in the services to the needy and elderly in rural communities and its partnerships with religious orders, universities and public sector entities.

OML could leverage these bonds of trust and its commitment to building rural resilience into leases for the land plots upon which the SPUs are situated. "The centers will be there for 20 years and all centers were built in partnership with monasteries or public organizations such as [the] Litani Water Authority. The [lands] were taken for free for 20-year leases based on the intention to provide services to farmers at break-even cost," Ghadban says.

He estimates the values of the plots that were made available for free at seven to ten times the constructed SPU infrastructure, and says the depreciation of SPU assets is calculated on a ten-year horizon. However, he elaborates further that the organization's efforts under its long-term approach and community presence would not stop if the projects in the current timeline were completed before implementation of a governmental strategy for agricultural development were to commence.

CLEAR STRATEGY FOR THE SECTOR

Latest at this point it becomes evident that besides the above cited factors of time, trust, and effort – which in the context of tight farming communities and a cautious rural mentality can be described as core social requirements for winning acceptance – projects aspiring to long-term improvements of agricultural and rural communities will equally depend on a healthy budget, a smart plan, a functional financial and governance infrastructure, and a good organizational infrastructure. "Agriculture needs investment, I mean. If you don't have [funds] to invest, agricultural growth will remain very restricted and be limited to the people who have cash and can invest," Ghadban acknowledges.

> "If you don't have [funds] to invest, agricultural growth will remain very restricted"

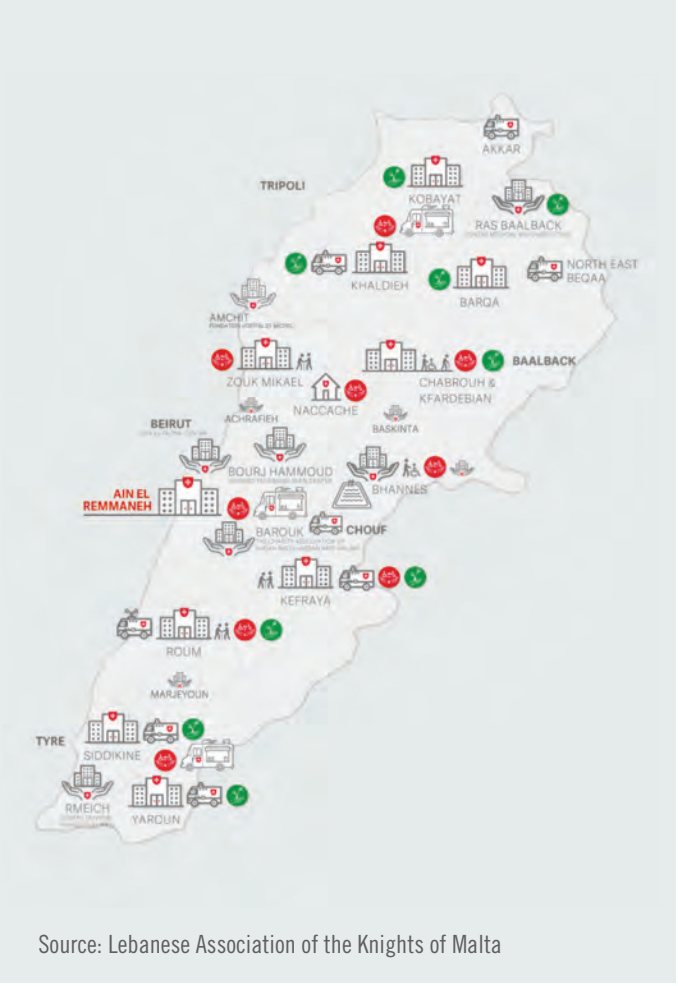
Asked for his estimate on the growth rates and timeframe of an agricultural renewal, he responds: "I would say that giving a time for phasing out of the crisis would be just throwing a number unless there is a clear financial system. But as someone who

OML SPU PROJECT WITH LONG-TERM RESILIENCE OBJECTIVES

Duration 2022 - 2042

Anchors: Agricultural services provision units (SPUs) operating under 20-year free land leases	
Established	5 SPUs
Target number	7 SPUs
Total surface area of SPUs	130,000 sqm
Of which covered by horticultural nurseries:	
Established	6,320 sqm (4.9%)
Targeted	14,440 sqm
SPU-affiliated horticultural nurseries to be in operation by early 2023	8
Total seedlings produced to date	2.1 million (supplied to farmers at break-even price)
Value of seedlings produced at nurseries to date	$22,700
Processing units at SPUs	
Existing	one unit established as pilot
Target	number yet to be determined in consultative process with farmers
Investment projection for processing units per SPU	$250,000 to $300,000
Human capital requirement per SPU	1 SPU manager, 1 technical expert, semi-skilled labor
Number of small hold farmers who have interacted with SPUs as clients	900

THE ORDER OF MALTA IS PRESENT ACROSS THE LEBANESE TERRITORY



Source: Lebanese Association of the Knights of Malta

"I cannot see a vibrant agricultural sector in Lebanon unless there is clear orientation from the government"

has worked in conflict areas, I cannot see a vibrant agricultural sector in Lebanon unless there is clear orientation from the government." By his reckoning, this will not come to pass before ten years.

The program's time line illuminates a notable difference in capacity and approach between OML, as a long-term charitable organization, and the comparatively young civil society organizations in Lebanon. All functioning humans are partial to something; ergo, the agendas of success are driven by determined minorities with partisan interests. In the wake of the Syrian crisis and Arab Spring enthusiasm of the early 2010s, many international NGOs and their local units and derivative local CSOs have emerged onto the Lebanese scene, altering the composition and expanding the focuses of the historic sector of charitable, religious, and social welfare organizations that existed before the dawn of the millennium and its United Nations-determined Sustainable Development Goals.

But while often less media savvy and less outspoken on fashionable causes than their international NGO peers, who are concentrating on rights that were drawn up since the Universal Declaration of Human Rights was adopted by UN member states, the religious charities and legacy organizations of goodwill have continued to play constructive roles in care for the proverbial widows and orphans, the sick, the poor, and almost all who have been economically and socially disadvantaged and overlooked by those in power. OML stands in this deep tradition in the Lebanese space and thus is both predisposed and well positioned for the pursuit of a project that is as challenging and slow-paced as agricultural transformation and recovery of real rural economy as a conduit of stewardship and resilience.

"Strategically, agriculture as a sector will be the main sector creating jobs for economic recovery as well as for business recovery in rural areas," Ghadban opines confidently, pointing out that by adoption a resilience point of view means that free distribution of services and seedlings has to be replaced with services that are provided on basis of break-even prices.

He says, "Looking at agriculture from a resilience point of view, means the need of addressing the challenges that have existed pre-2019 while taking into consideration the needs of post-2019, through long term approach to change rural communities and make the agricultural system more resilient and feasible."

By Rodrigue El Balaa

AGRI-FOOD INDUSTRY AND ACADEMIA

Different languages but a common future

They say Women are from Venus and Men are from Mars, but they can still manage to settle on a common ground, and carry a fruitful relationship which might last for years. Industry and academia have long been considered as living on two different planets and speaking two different languages, but what if they succeeded in setting a common language? How would they both benefit? And most importantly, how to get there?

Recently, one international beverage company with business in Lebanon decided to explore the possibility of valorizing its by-products by using them as a component for animal feed, as part of its circular economy initiative to decrease its waste disposal cost. A collaborative thesis was agreed upon, and research work started on identifying potential buyers and the nutritional input of these by-products. It went very well and the student was able to successfully defend the thesis. However, when a complementary collaboration was discussed which included production optimization, the collaboration could not move any further since there was a need for access to the production process, and the delicate data it included. Yet such information could not be divulged, so it was impossible to publish any peer reviewed papers; the university lost interest and the collaboration ceased at an early stage. Both parties had their points, the industry needed to protect its production process which is integral to its success, while the university needed to publish papers to preserve its ranking.

This is just one example of many collaborative initiatives which either were short-lived or failed to launch. Limited access to data, as illustrated in the above case, is only one of various difficulties between the collaboration, which include:

- Timing; universities have their own academic year cycle and research projects are identified usually in September at the beginning of the fall semester, but a company cannot wait if it needs quick answers for technical challenges.
- Intellectual property; for any innovated process, the technology or product is debatable between the industry and the academic institution, and sometimes the researchers themselves, which warrants a serious legal support and collaboration framework.
- Research pace; usually researchers have solidly established protocols and have the ability to accumulate knowledge over years, meaning they have a relatively slow but steady pace. For industry, solutions usually need to be developed quickly and need to be adapted even faster to market variations.
- Objectives; which can be can be contradictory for academia research to industry priorities. So while researchers could be concentrating their efforts on subjects like social responsibility, the greenhouse gas effect, and animal welfare, many companies may prioritize production cost reduction, market access, product quality, etcetera.

TIME TO COLLABORATE?

Nevertheless, collaboration between universities and industry through technology or science parks started in developed countries, in 1951 with the Stanford Research Park which emerged later as part of the Silicon Valley and in 1972, Europe's first technology parks were created with the University of Nice Sophia Antipolis in France, and Cambridge University in England. The concept has thrived since then and has become one of the major strengths of modern economies. Can it be applied it to the Lebanese agro-economic ecosystem? And is now the right time to reflect on such a collaboration?

At the end of 2019, the dramatic downward

spiral of the Lebanese economic system started, with the agri-food model the fastest to fall apart, although many argue that there was no agro-food model to start with since it was based largely on import input. Access to finance became a nightmare, cultivated land decreased, food processor companies went out of business, and consumers saw their purchasing power disappear in a terrifying pace as many became largely dependent on monthly food basket support from local NGOs.

Universities were also hit hard and fast. In a record time, the value of student tuition evaporated as the Lebanese pound plummeted against the dollar, the same went for the professors' wages, and thus a "brain drain" was triggered. For many, there was nothing to do but to reminisce on the "paradise lost"; but for others, it was the birth of a new era, where anything was possible. But first, it is important to reanalyze the effects of the multidimensional cataclysm and most importantly focus on what can be built now which was impossible before.

The disruption brought by the crisis led agri-food stakeholders to rethink their strategies, and they have since discovered that monetary depreciation could be an actual incentive to produce more price competitive products through accessing foreign markets. But price is not the only parameter to be considered, international markets need specific thresholds of quality, hygiene, packaging, and transportation conditions to be respected. In addition, investing in Research and Development departments within Lebanese agri-food small-to-medium enterprises proved impossible, so the only way to improve products to enter international markets was through access to already available facilities for specific product development. This could not have come at a better time for universities which lacked the needed funds to carry out research activities, with an added bonus to pivot research activities into more practical use with greater emphasis on development. Moreover, the large pool of experts that can be provided by universities offers an immense advantage for industries that seek solutions to their challenges without the need to hire experts on a full-time basis.

The need to collaborate between academia and industry is clear and the benefits for both parties are numerous, especially within the current crisis context. But how is it possible to initiate this collaboration and what is the needed physical and administrative infrastructure?

The first element for the success of the said collaboration is the human element and the need for actual "translators" who can play the role of mediators between academic institutions and industrial companies. These entities would base their interventions on qualified personnel from both sides who can understand the challenges and the expectations of each and provide a mediation to come up with the best collaboration framework. These "translators" would also work on adapting the mindset of both parties to more collaborative approach while at the same time preserving each party's interests.

There is also a great need in university technology transfer offices who provide support to researcher and student in transforming their research findings into viable products or business models, and to protect them through proper intellectual property frameworks where the university, the researchers and the industry have all their part of the patents ownerships.

Initiating collaboration between academic institutions and industrial companies needs a physical framework where they can meet, exchange ideas and expertise to eventually adopt different collaboration models. This initiative is part of the Agri-Food Innovation Days organized by Berytech, a local entrepreneurial support system. Over three days, universities and industries met and exchanged ideas, challenges and solutions. This year, six grants were offered by QOOT, the Lebanese Agri-Food cluster, for final year projects in universities to provide answers to challenges faced by different members.

> The world is full of success stories where industry and academia collaborated

This collaboration could evolve to establish technology parks within universiy premises, which would also offer a common space for research on technological solutions to agri-food companies, as well as offering both researchers and students direct contact with companies. Through this platform agri-food companies would also have access to universities' incubators where start-ups are being created and provide vital input, but also create investment opportunities, and perhaps eventually work with them as sub-contractors or developers.

The world is full of success stories where industry and academia collaborated and the opportunities currently offered by the Lebanese context are immense. The country needs to work its way up to Agriculture 5.0 where artificial intelligence, IoT and machine learning are used in a multidisciplinary approach. This set of diverse human know-how and equipment is available in universities, and the objectives for their application are determined by industry. To my knowledge, this is a perfect combination for a long-lasting collaboration between two entities which may speak two different languages but share a common future.

Rodrigue El Balaa, PhD, is the director of the Agricultural Value Chain Development Center at the University of Balamand

By Sami Nader

CAN LEBANON COMPENSATE?

New agricultural policies are needed to wean Lebanon off imports

In light of Lebanon's context and current difficulties, food security should focus on the ongoing availability, affordability, and accessibility of nutritious food products that satisfy the dietary needs of every Lebanese. Furthermore, the Lebanese agrifood industry must be developed to promote competitive exports, value-added activities, employment opportunities, and the expansion of Lebanon's total food system in order to attain self-sufficiency.

Lebanon lacks quality products, modern agricultural practices, proper safety standards, traceability and a reliable certification system, limiting its agricultural potential on the national level, as well as its export potential and its integration into global value chains. Lebanon can be considered self-sufficient when it comes to fruits, vegetables, and wine; however, the country remains highly import dependent, importing more than 80 percent of its food needs. This pattern of behavior causes the country to be highly susceptible to shocks. Agricultural inputs (such as irrigation equipment, seeds, pesticides and fertilizers) are primarily imported, and have all witnessed price hikes, making it more difficult for small-scale farmers to obtain these inputs, and forcing the majority to replace them with agricultural inputs of lesser quality, possibly leading to poorer yields and lower revenue, as per findings from Scaling-up Agri-Food Innovations, a project implemented by USAID to reduce the agricultural sector's import dependency.

Animal feed is also imported, and is essential for the dairy and poultry industries. According to the World Bank, 1.7 million Lebanese are estimated to have fallen under the poverty line, with 841,000 of those under the food poverty line, as noted during the period between 2019 to 2021. However, food insecurity is more prominent in some regions than others, with the North governorate reporting the highest percentage of 27 percent compared to the Mount Lebanon governorate with 16 percent, as per the United Nations's OCHR 2021 Emergency Response Plan for Lebanon.

A CLEAR STRATEGY IS OVERDUE

Achieving full self-sufficiency seems overly ambitious; however, this does not mean that Lebanon's local agri-food sector cannot contribute to food security. First and foremost, Lebanon requires a clear strategy for its agri-food sector, one that identifies the most resilient sub-sectors and the most vulnerable sub-sectors; the most prominent challenges for every sub-sector; the most prominent challenges for agricultural water supply and availability; and the most prominent challenges limiting export of agri-food products; paving the way for complementary legislation and projects to improve overall agricultural standards, and provide farmers with the ability to improve their services for both the national and international markets. Generally, the agri-food business possesses two critical functions:

1. Promoting and maintaining food security;
2. Creating jobs and revenue within the industry.

> The strategy must also capitalize on Lebanon's highly skilled labor pool, as well as incorporate modern technologies and automated systems into farming operations

However, the precariousness of Lebanon's socioeconomic climate, the limited access to finance, and the undependable nature of public institutions have impaired the agri-food business' ability to fulfill these functions. Developing an agricultural

strategy necessitates a thorough examination of the interconnections between the agricultural system and the resources that support it (land, energy, water). Decisions across various resource systems are frequently made with insufficient coordination. The strategy must also capitalize on Lebanon's highly skilled labor pool, as well as incorporate modern technologies and automated systems into farming operations. Foreign market demands and criteria must be evaluated in order to develop high-quality foods for these markets. Accordingly, new agricultural policies should be designed to ensure export stability, demand development for local goods and the subsequent introduction of new commodities at the local and international level.

In the short-term, food consumption patterns and food security metrics should be studied to identify important indicators such as domestic production quantities and values, domestic consumption quantities, and exports and imports for each item related to the agri-food industry. Based on these figures, strategic local production sectors, which are most likely those where Lebanon is already self-sufficient such as fruits, vegetables, and bulgur wheat, should be prioritized. Moreover, incentivizing farmers to substitute traditional crops for imported produce that is essential for food security (e.g. chickpeas, barley); or substituting crops which operate at a loss with crops containing higher input to the human diet (legumes as sources of proteins and cereals or potato as source of starch), can help limit import dependency.

Sami Nader is a Lebanese economist and director of the Levant Insititute for Strategic Affairs

EXCLUSIVE INTERVIEW WITH ALI N. KARAMAN

He has been with PMI for 23 years, and now, Ali N. Karaman is Philip Morris's newly appointed Managing Director for Egypt & Levant. In an exclusive interview with Executive, Karaman takes us through PMI's plans for the next coming years in fulfilling a smoke-free transformation, the value in Lebanon's market, and PMI's new vision in today's fast changing world.

Prior to his appointment as MD of Philip Morris Egypt & Levant, Karaman served as the Director of Smoke Free Products for the Middle East cluster, where he led the commercialization of Smoke Free Products in many Middle East markets while establishing deep industry knowledge and strong commercial expertise across various complex markets.

Can you discuss the transformation taking place at PMI and the company's new vision?

PMI's global business transformation is about delivering on our vision to create a smoke-free future. To make our vision a reality, we are transforming and staking our entire future on scientifically substantiated smoke-free products that are a much better alternative for all adult smokers who would otherwise continue smoking. Getting away from cigarettes would be the most significant, positive disruption for the estimated 1.1 billion adult smokers worldwide—and we have the means to achieve this in the not-too-distant future.

Why is the Lebanon considered an important investment market for Philip Morris?

Despite the endured multiple crises including economic, financial, political and security crises, Lebanon remains a dynamic country. I'm impressed by the resilience of the Lebanese people and their ability to remain forward looking and progressive despite the many challenges they have faced.

PMI has always been present in Lebanon, even during the turmoil of the civil war. In 2018, we took our partnership with the Regie to the next level when we started Marlboro medium production locally at the Regie's facilities. We invested in new lines that are still operational and remain committed to Lebanon and further development of our business relationship with the Regie.

Why is it so important for Philip Morris to develop smoke-free products, especially in a country like Lebanon with high smoking rates?

Since 2008, we have invested more than USD 9 billion to develop, scientifically substantiate, and commercialize smoke-free products for adults who would otherwise continue to smoke, with the goal of completely ending the sale of cigarettes, as smoking is the cause of serious diseases, and the best way to avoid the harms of smoking is never to start or, for those who smoke, to quit. That is why PMI is now actively working to expand its purpose and evolve into a broader lifestyle, consumer wellness and healthcare company, extending its value proposition and innovative capability to commercialize products that go beyond tobacco and nicotine.

In Lebanon, there are more than 1.4 million smokers, and has one of the highest smoking incidences in the region. Therefore, Lebanon is an important market for our smoke-free vision. The latter, combined with the dynamic and progressive nature of the Lebanese people, it was imperative to introduce our smoke-free vision in Lebanon. We have launched IQOS back in February 2020, just one year later we have launched Lil, a more affordable and accessible device. We have increased our offering to the Lebanese consumer and are constantly looking for ways to help Lebanese smokers switch to better alternatives.

Can you explain, in your own words, why heated tobacco products cause less harm that traditional cigarettes which require burning?

The available information about heated tobacco is not a matter of theory or speculation. It is substantiated scientifically and through tests and practical use. Heated Tobacco products emit on average 90% lower levels of harmful chemicals compared to cigarette smoke, but that does not mean 90% reduction in risks as Heated Tobacco products are not risk free. In heated tobacco products, the tobacco is heated at a controlled temperature without burning it, in order to release a nicotine containing aerosol. In the aerosol of a heated tobacco product, water and glycerin form approximately 90% of the aerosol mass, there are no solid particles, and the levels of toxicants are reduced on average by 90% compared to cigarette smoke.

What can you share about PMI's long-term goals 5-10 years down the line in the region?

In 2015, our CEO Andre Calantzanpoulos made a bold statement announcing the ambition of the company to replace cigarettes with smoke-free products. Since then, Millions of adult smokers have already switched to our smoke-free products and given up cigarettes completely—and this is just the beginning. One of our key strategic priorities is to develop, assess, and commercialize a portfolio of innovative tobacco and other nicotine-containing products. We draw on the expertise of a team of world-class scientists from a broad spectrum of disciplines to help us reach our goal of replacing cigarettes with less harmful alternatives. Replacing cigarettes with less harmful alternatives is at the core of our business strategy and sits atop our sustainability priorities.

In our region, there is a high smoking prevalence with little awareness on the available alternatives to smoking. However, I strongly believe a smoke-free future is attainable, and the benefits it can bring to the people who would otherwise continue to smoke, and hence to public health, are enormous. However, the company cannot succeed alone. Together with governments and civil society, we can maximize this opportunity by achieving a consensus that smoke-free alternatives, when subject to proper government oversight and regulation, are part of a sound tobacco policy.

How do PMI's Environment, Social, and Governance (ESG) goals come into play in Egypt and the Levant?

To meet environmental, social and governance (ESG) issues it is necessary to employ adequate governance practices. PMI's plans seek to take into consideration sustainability and social impact strategies, which are very important, especially in Egypt and the Levant. Our company principles of turning words, intentions and commitments into action are going to be translated into cooperation with organizations and institutions to achieve a positive impact and try to make a difference with regard to many aspects of ESG issues.

Why do you think it is critical to be launching a new vision characterized by EPPIC disruption in today's world?

In today's fast-changing world, you can always choose to do nothing. Instead, we've set a new course for the company—we have chosen to do something really big. We're creating a PMI that will be remembered for replacing cigarettes with a portfolio of revolutionary products. This the EPPIC disruption in our opinion as it is characterized by five main criteria, which is being Efficient, Purposeful, Pro-social, Inclusive, and Constructive.

PMI's new vision reflects the company commitment to society, which expects us to act responsibly. We are doing just that, by delivering a smoke-free future. Our vision is critical as millions of adult smokers are looking for less harmful, yet satisfying, alternatives to smoking. Our mission is to give that choice while keep warning them about the risks that could be associated with any of our products.

What do you anticipate will be the biggest challenge in your new role as the Managing Director for Egypt & Levant?

The region has been very welcoming to me so far. I also consider myself lucky to be working alongside a very motivated and exceptional team in Lebanon. Throughout the years, this team has been able to achieve a lot of successes and drive the business forward. Our people are our main asset that will help us to deliver exceptional results and maintain our successful relations with our stakeholders, business partners, consumers and regulators.

I believe a big management challenge in any place is to have a clear vision and strategy. Fortunately, this is exactly the advantage of working with PMI. The company vision and strategy are obvious, and my role as Managing Director is to communicate them to consumers in the region I work in. The challenge is to make the smokers see and feel the benefits of our policy of smoke-free products, to convince them of switching to "less-harmful" products or to quit smoking completely.

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SPECIAL REPORT

FOOD ENTREPRENEURSHIP

> Building food security entrepreneurially
> Homegrown startups on the agro-business scene
> Lebanon's accelerator programs
> The financial obtrusions for young businesses
> Niche producers and export expectations

In partnership with

KONRAD ADENAUER STIFTUNG

By Thomas Schellen

Building food security entrepreneurially

Food can take a lead role in Lebanon's entrepreneurship ecosystem

An entrepreneurship ecosystem captures the essence of entrepreneurial energy in a cycle of economic life. For these energies to become manifest and productive, ecosystems need a constant supply of fresh and ambitious business-oriented minds which are equipped with unconventional ideas. Those will often be minds emerging from the tertiary education system, although the entrepreneurial spirit can just as well shine in self-taught enterprise builders who have fortified themselves with experiences and practical insights.

In transforming talents into victors and disruptive ideas into success stories, the functioning of an entrepreneurship ecosystem will combine the benefits of a broad enabling environment with the effectiveness of nurturing units, namely the incubators and accelerators. Today these units are intrinsic to fast entrepreneurial processes of turning – in the culture of capitalism naturally and inevitably occurring – practical breakdowns of new business ideas into chains of development in which these ideas and human energies pivot from failing rapidly into improved iterations.

This is all economic theory until a country starts building its knowledge entrepreneurship ecosystem, a decades-spanning effort which in the

case of the Lebanese one originated in the context of the early commercial internet at the end of the 20th century. This Lebanese tech and knowledge economy ecosystem emergence involved a period of gradual formation from the late 1990s into the early 2010s, not a perfectly balanced growth spurt with a deliberate infusion of funds and intense human capital investments in the 2010s, but lately a pivot to a new and more organic development phase that began with the painful loss of most funding and disappearance of some ecosystem players in 2019-20.

During the growth period of the 2010s – decisively induced by the famed Circular 331 of Banque du Liban, Lebanon's central bank – the entrepreneurship ecosystem was tilted in favor of the "tech" component of technology-driven startups built around computer applications in education, health, advertising, communication, and finance (Healthtech, Adtech, Fintech, etc). With funding and equity deals for these startups hyped all too often beyond reasonable valuations, one would encounter several short-lived tech meteorites, or worse the occasional zombie venture, for each new star team and viable application.

Already during the ecosystem's formation phase, which saw software houses, wedding, auction, and online financial services sites feature prominently among its New Economy ventures, early ecommerce startup founders naturally had food on the top of their minds. Whereas plenty of online ventures of the Lebanese dot-com bubble days have long been forgotten, Karim Saikali's website, buylebanese.com, is today a rare holdout venture from this era. Delivery of Lebanese food products to aficionados in the diaspora was driving Saikali's business when the site went live in November 2000, embarking on an ecommerce journey that included periods where the founder would run the entire operation single handedly from his laptop while sitting at this or that Beirut café.

Furthermore, notable agriculture and food related entrepreneurial brands were created during the 2010s, examples reported by this magazine include the niche consumer brands Taqa, Eshmoun, and The Good Thymes. Executive Magazine's top 20 entrepreneurs list of November 2012, which was the most extensive one the magazine produced in a single year, featured one cooking/foodie site (Shahiya), one purveyor of organic food boxes (O'Box), and one olive-oil venture (Olivetrade/House of Zejd).

In the Lebanese tech entrepreneurship ecosystem of the 2010s, it was the default profile of a successful startup that penetration of markets other than Lebanon might shape a viable economic narrative out of a startup with a minimum viable product and local or better, regional, adherents. Although local job creation and knowledge economy focuses were deeply embedded into guidance force of Circular 331, the Lebanese entrepreneurship ecosystem by necessity of the small domestic market defied many high-blown expectations for job creation – which were incidentally not focused on rural growth but formulated in relation to the online tech services and urban ancillary realm.

EMERGING SUB-TRENDS

Under the pandemic scenario of 2020 and even more so under the purchase power and market constraints of the world after the Lebanese pound's collapse, the trend of outward orientation of Lebanese tech startups intensified. The ecosystem witnessed the emergence of sub-trends; like the trend of moving to entrepreneurship nurturing environments found in Dubai, Paris, London, or anywhere outside of this country. Another accelerating shift saw startups keep part or all of their back office and development "kitchens" on virtual islands of connectivity in Beirut while seeking clients outside.

> In recent years, some household words in the Lebanese food culture have been adopted into US culture

A third sub-trend saw the thriving of platforms which focused on making Lebanon an outsourcing destination from which clients around the world could contract remote knowledge workers. Under a fourth sub-trend, ecosystem stakeholders were treated to a – in part domestically focused – surge in the number of advertising and ecommerce facilitators which delivered e-commerce platforms and market access strategies to local companies. This trend was based on the fact that local niche producers delved into operation of proprietary e-commerce platforms with focus on multiple target markets, among which the Lebanese market could be one – but did not have to be.

It is out of this entrepreneurship diversification and ecosystem change that the acceleration and incubation tech ecosystem has also seen a new successful entrepreneurial economic DNA mixing pool (see story on accelerators and programs on page 86) come up where the gametes and zygotes of Lebanese agricultural entrepreneurship and innovative zest combine into agro-entrepreneurial ventures that seek to interact with markets in search of sustainable profits which contribute to the recov-

ery of the economy.

In many cases, enterprises that arose out of the tech entrepreneurship ecosystem over the past 20 years did not generate as many jobs as hoped, but they created change impulses for the direction of the Lebanese services economy. By the same logic of fostering positive change, the agro-entrepreneurship generation in our 2022 lineup (see profiles on page 80 for a look into their diverse range) include agriculturally oriented ventures that have startup appeal but also new impulses to offer in the areas of agricultural production and rural livelihoods.

Beacons of an entrepreneurship ecosystem that is inclusive of a strong agro-entrepreneurship component are observations that – partly under the impact of the pandemic and partly under the weight of the economic crisis – increasing numbers of university graduates and seasoned professionals have been rediscovering their village roots and been embarking on agro-entrepreneurial startups. Also of note is the outstanding vibrancy radiating from exhibitors at events focused on small green, innovative, and agrarian enterprises, from the legacy Horeca show in March of this year to the Vinifest and Green Innovation events of October.

Stakeholders interviewed by Executive during our investigation of the food value chain and food security situation of Lebanon emphasized that in an integrated system of agro-entrepreneurship, food exports will play a decisive role for Lebanese food security. They noted further that food exports require access to markets, which in the digital era will include proactive digital channels.

In recent years, proliferating online platforms of Lebanese producers, and the locally based specialized ecommerce platforms or online shopping malls, have important roles to play in this regard. Interestingly, the Lebanese entrepreneurship landscape of ecommerce and marketing also includes online ventures that are focused on Europe, such as Brussels-based Key16/Seven Shelves and the North American market from within the United States. These startups could contribute to the invigoration of Lebanese exports, food sovereignty, and food security. An example whom Executive conversed with is Za'atar Road, which in 2020 embarked on bringing artisanal Lebanese agro-food products to high-end foodies and health-oriented consumers in developed North American markets.

THE CURIOUS CASE OF THE EXPATRIATE ZA'ATARPRENEUR

Founder and chief executive of Za'atar Road Maya Hachem says she conceived of the startup shortly after the August 4 Beirut port explosion in 2020. She soon found an investor who backed her to help young entrepreneurs and artisanal food product makers in Lebanon, while also latching onto trends for healthy food and benefit from the large number of health food stores in the United States.

After her business plan was hatched and presented to one or several US-based investors (in response to an interview question by Executive, Hachem declines to divulge details on her startup capital or investor base), she undertook an exploratory visit to Lebanon for sourcing of suitable products. Her sojourn of scouting rural Lebanon and talking to producers in villages across the country lasted three to four months and yielded several hundred prospective artisan food producers as prospective partners – a success which set the founder of Za'atar Road onto a track of heading straight into a significant barrier.

> The tech entrepreneurship ecosystem over the past 20 years did not generate as many jobs as hoped

"I had to hire a small team in Beirut to bring us all the samples that were then run by the food and drug administration (FDA) for checks and approval. This has been one of the most challenging

parts of implementing the whole business model. Of the 452 artisans that I reached out to, I could only get approval for 62," she tells Executive.

After gaining FDA approvals, three containers with 400 different products were sourced and Hachem embarked further on her push to market. "We are only focusing on small productions and small batches from suppliers who meet the criteria and procedures for FDA approval," she notes.

Having internalized the insight that it is anything but easy to bring Lebanese products to the North American market, Za'atar Road's Beirut-based supplies manager focused on securing the flow of small product batches to meet FDA requirements, while satisfying Hachem's core business concept of not working with big names in Lebanon's agro-industrial sector.

In the meantime, even after the product range was set to companies that had business registrations in Lebanon and met the food safety, labeling and all other FDA standards, Hachem says she frequently worries about economic and infrastructure barriers in Lebanon which might obstruct her artisan suppliers' ability to deliver products in the needed quantities.

"Our product range includes spices, olive oil, soaps, jams and honeys; we have a little bit of everything," Hachem says. In her first round of product sourcing, she focused on artisanal food products, but the scope of Za'atar Road's supplier search is now being widened to non-food products.

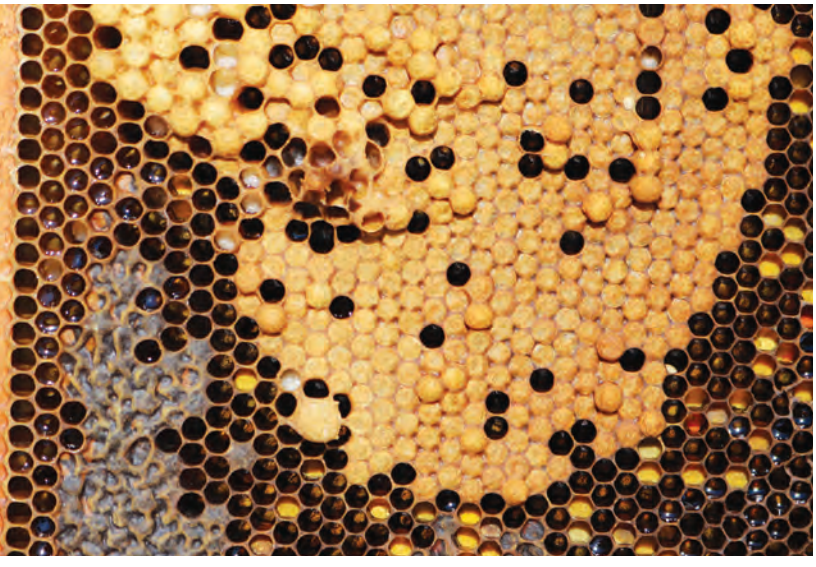
The next business challenge on her path is the unpleasant duty to revise and rationalize the product range. In doing her trial to see what products work with the US consumer, "we experienced that some products do better than others. [Thus] we will by the end of this year have to decide which products and suppliers to strike from our range. If those suppliers can have a niche in another market, it will make more sense for them to sell their products there," offering her rationale for what she describes as an upcoming hard decision.

Over the year of 2022, her operation has expanded from an online-only platform with 400 SKUs and usage of an external ecommerce fulfillment center to wholesale relations with several gourmet stores in US urban population centers. "It has to be the right store, though. The idea is not to have our products anywhere and everywhere," Hachem adds. She does not target the Middle Eastern communities in the US with Za'atar Road as much as fine-food stores in the upper market reaches.

Hachem says she frequently worries about economic and infrastructure barriers in Lebanon to deliver products

With regard to questions on financial aspects of Za'atar Road operations to date, she says that her Lebanese suppliers have so far been paid upfront in fresh dollars and her sourcing costs have been stable under this formula. As to figures that she is willing to disclose, Hachem says that Za'atar Road's headcount has reached seven and names a revenue target of "around $5 million in the next two years." Fundraising for more capital is on her agenda for a later stage of development.

As Hachem notes, in recent years some household words in the Lebanese food culture have been adopted into US culture or even become trendy in foodie circles. Many other terms, however, have yet much room to define a Lebanese niche in developed food cultures by which they would adequately represent the contributions and values of the culinary wealth of Lebanese lands. An integrated agro-entrepreneurship ecosystem that brings expatriate and local constituents together in demonstrating the diversity and depth of Lebanon's culinary tradition, is hopeful on the two counts of helping in the reduction of food insecurity by the indirect path of improving exports, and contributing to real economy sustainability and food sovereignty.



By Rouba Bou Khzam

LEBANON'S AGRO STARTUP SCENE

These homegrown businesses are discovering the natural joys of Lebanon's ancient lands

DRY AND RAW

Dry and Raw is a boutique food idea, inspired by nature and with the hope to provide local and international customers with up-market natural and organic food products from Lebanon. Dry and Raw is not only an idea, but a lifestyle lived by brothers Nabil and Dani Khoury. "Being in the West allowed me to go and learn more about food and alcohol," Nabil Khoury tells Executive, alluding to the time he lived abroad. "I got all this knowledge and I have been using it for myself and friends at home for more than 30 years."

After time away, Nabil returned to Lebanon at the start of 2019 with a career change in mind. "I saw that I was really ready to jump into this food and beverage business because I have been practicing for so long, and I have got all the training and trials to master what I do," he says. The brothers then sought to share their "food experience" with the public.

Dry and Raw - the business name touches upon their style of products - is currently producing more than 600 food items in-house, using organic and naturally grown products from its farm in southern Lebanon. They are considered one of the first food boutiques in Lebanon to produce seeds, nut oils, and foreign-style cheeses. For more than two years, the business has been producing over 36 types of European, British, and American cheese.

Dry and Raw has offered new food trends to Lebanese clientele and provided better quality with affordable prices as a substitute for many costly imported foods. Their products are distributed to more than 25 markets in Beirut, Matn, Jounieh, Batroun, Tripoli, and Chouf, while 30 restaurants and hotels are fond of their European cheese range.

The brothers also organize education sessions and awareness for customers to learn more about the food they are producing. In addition, they hold summer internships for food science students at university, including at the Lebanese University and Saint-Joseph University, to teach how cheese is made and to spotlight the practice of food theory.

Dry and Raw are environmentally conscious. They refrain from using plastic bags and instead use paper bags. They work on recycling all the jars and glass bottles that they use, while their clients also collect the jars and bottles to return them for recycling. "It is in our culture to preserve nature," Nabil says.

The business was not exempt from the economic turmoil of the past few years in Lebanon. In 2020, their first year of trade, they incurred losses resulting from the economic impact of the Covid-19 pandemic, and now power outages are causing new problems. Long power cuts are impacting refrigeration for food, especially during the summer temperatures, increasing the risk of food deterioration, loss of quality, and a reduction of shelf-life. "In summer, we had to stop some production lines, such as ice cream sorbet and dried vegetables and fruits. And we are no longer storing fresh dairy products at our boutique," Nabil says.

Despite Lebanon's declining economy and volatile politics, he is hopeful about their future as entrepreneurs. "The odds are not in our favor, but we're Lebanese, so we'll figure it out. The resilience is what makes us special, the positivity almost looks naïve, but it isn't. It's hunger, it's the will to continue and make a difference."

BALSAM JBALNA

Umeboshi, pickled or fermented Japanese plums, is a rare and expensive delicacy with macrobiotic health benefits which is now being cultivated, produced, and packaged in Lebanon. Since October 2020, one local company has picked the wild plums that grow 1,400 meters above sea level on Mount Lebanon, to create the Japanese snack.

Hanan Bou Najm, a macrobiotic nutritionist and founder of Balsam Jbalna, the company that makes Lebanese umeboshi, started her business as a response to a gap in the local market for umeboshi. The delicacy is an essential part of the macrobiotic dietary lifestyle. In Japanese, "ume" means plum, while "boshi" means fermented.

"Due to the Lebanese economy's deterioration, I decided to start the first umeboshi project in Lebanon," Bou Najm says. "During the Covid-19 pandemic we couldn't find umeboshi from Japan locally," so we asked around in villages and among the farming community, and found that Lebanon had a very well-kept secret."

After conducting research, Bou Najm found that Lebanon naturally has a lot of wild plum trees, with the mountainous regions the best source for this particular type of plum, which is part of the prune family. Farmers used to cook and ferment the fruit over 500 years ago, for a paste similar in style to a tomato paste, Bou Najm explains.

At first, Bou Najm tried cooking the plums and pickling them, but found that fermentation worked better. The intense sour and salty notes make Umeboshi a perfect condiment for Lebanese cuisine, she says, adding that the plums and berries can be added to salads like tabbouleh or fattoush, as well as with cooked beans and vegetables, or rice balls wrapped in seaweed, salad dressings, dips, and spread.

Bou Najm found that Lebanon naturally has a lot of wild plum trees, with the mountainous regions the best source for this particular plum

Knowing that pollution is a major problem in Lebanon, particularly among the coastal regions which are hit by traffic and under the smog of power plant fumes, Bou Najm made a point to forage in the highest mountain areas and valleys, in the hope that the produce there would be least impacted by the pollution. "We would park our cars and walk up for two hours. We were ten men and women, and we would collect the plums as well as other wild berries, which we mixed in with our fermented plums."

In addition to creating a value-added product that is in high demand worldwide, Bou Najm has created a locally affordable alternative of a specialty Japanese product that is within Lebanese consumers' reach, selling it for a fraction of the price of imported varieties. "This product was imported from Japan through the following companies: Nabat, Clear Spring, and Naturalia [and] were sold for $15-$20, while Balsam Jbalna is sold for $2-$3," Bou Najm says.

Exports of plums, paste, and vinegar could help bring in much-needed hard currency to the country during the current tough economic situation, although exporting remains a challenge, Bou Najm says. "Balsam Jbalna product is not exported, although there are large quantities of it. This is mainly due to a legal fact; the product is made at home; I don't have yet a healthy kitchen that has a certificate of origin registered in the Ministry of Economy."

Like many residents, she is struggling with the high rent prices and Bou Najm says she is not yet financially stable enough to rent a working kitchen space. And like many other Lebanese entrepreneurs, she is looking for investment to develop her business.

The ability to transfer money or pay internationally is a big hurdle for startups

GUDTOLLI

Gudtolli started in 2020 when three women Leila Khalife, Reine Khalife, and Najwa Youssef met and decided to start a business, after carrying out a study and discovering a lack of fresh pasta in the local market. So, they decided to produce a new Lebanese product to substitute an imported one.

Gudtolli produces fresh pasta, naturally made and colored from vegetables, like beetroot, basil, spinach, carrot, pumpkin, and turmeric. Their mission is to provide healthy, natural, and great-tasting pasta in a variety of traditional Italian shapes like fusilli, macaroni, and conchiglie.

"What makes our pasta special is the combination of Lebanese culture and Italian cuisine that portrays a small festival on your plate. Gudtolli brings the garden to your table along with its natural colors, nutrients, fibers, and vitamins. It is full of benefits with no additives or preservatives," Leila Khalife tells Executive Magazine.

In February 2021, the company was legally registered and later in September the products began to be distributed in retail markets in Mount Lebanon, Keserwan, Jbeil, and Beirut. The company and its 20 female employees are located in Safra in the Keserwan district. "We believe that the best way to preserve our culture is to keep it alive. Empowering women and Lebanese farmers and increasing their participation in economic growth are among our utmost goals," Leila says.

As well as selling pasta, Gudtolli holds monthly pasta making workshops, so participants can learn the art of making pasta and accompanying sauces. The women see it as an opportunity to learn and share knowledge about pasta history and Italian cuisine. The menu includes tagliatelle, spaghetti, ravioli mushroom, tortellini Cheese, pappardelle, farfalle, and farganelli, fully decorated with vegetables and herbs.

Today, Lebanese entrepreneurs and small businesses are operating in a highly volatile environment with almost no state support. "The crisis is affecting our ability to operate and our ability to work," Leila says. She adds that the ability to transfer money or pay internationally is a big hurdle for startups. In addition, the dollar to Lebanese pound exchange rate is increasing every day, which increases the payment of their goods. At the moment a bag of Gudtolli pasta sells for around 80 cents, while the jar version, with its reusable aspect, is one dollar.

Despite all the country's circumstances, Leila and her team are taking responsibility seriously. They are aware of their strengths and weaknesses. As a team, they participate in different competitions and exhibitions. Months ago, they won an award from Bloom, a local non-profit which supports entrepreneurs through various programs, among other awards. They also won a place on Berytech's Basatine Program, a four-year consortium program which supports farmers and related value chain actors in the cereals, legumes, and vegetables in Bekaa and Akkar regions.

For Joseph, it was integral to her startup journey to learn more about what it takes to run a business

OLIVE BIO

As the olive harvesting season gets under way, people across the villages of Lebanon are dusting off their jars and bottles to fill up with this year's bounty, following an annual tradition which commemorates the richness of Lebanon's lands. The natural and ancient foods cultivated in Lebanon are important to daily life and the country's heritage and culture. A Lebanese kitchen would not be complete without olives and its oil.

Even though many young and educated Lebanese have emigrated in search of better opportunities since jobs and business dried up during the crisis, there are still young energies to be found who are working hard to reap the rewards of Lebanon's fertile land. This is the case for Sarah Joseph, the co-founder of Olive Bio, who in January 2021 returned from France to her family's land in El Qattine, in the Keserwan district, to become involved in farming and agricultural activities. Since 1515, her family have existed on the land.

"After specializing in food quality, I decided to take an interest in going from farm to fork. My journey started in the hope of giving others a taste of nature," Joseph tells Executive. "It's a long road yet a rewarding one."

Wanting to produce in a traditional way and directly from her farmland, last year, Joseph created a range of products to bring some diversity to Lebanon's existing olive variety. Here is where Olive Bio was born. Along with her parents and some laborers, Joseph works with top quality Italian olives cultivated on their land.

They produce olive oil, olive soap, and five different flavors of olive tapenade: green tapenade with almond or with basil, black tapenade with walnut, chili, or caper. Their tapenade mixes are adapted for each recipe, so the freshness and natural taste of the ingredients in the recipe remain.

Many entrepreneurs and startups in Lebanon struggle due to their lack of access to finance, lack of human capital and resources, and expertise to help plan growth and expand further. For Joseph, it was integral to her startup journey to learn more about what it takes to run a business; though she holds a degree in food engineering, she felt it was not enough.

Since launching her startup, she has attended training and workshops to improve her skills and capabilities. She says this helped her learn that the following characteristics and skills: confidence, perseverance, patience, communication skills, and risk tolerance, are some of the main tools' entrepreneurs need in order to succeed.

All ingredients and raw materials are manufactured and produced in their production facility in El Qattine, their olives are a mixture of Lebanese and Italian, and each 300g jar sells in a competitive price range from $6.50 to $7.50. Olive Bio aims to be environmentally friendly; they happily take back empty jars customers return with a discount on their next purchase. "By doing so people will be helping small businesses and our environment," Joseph says.

In view of Lebanon's long-term structural challenges and the profound effects that subsequent crises are having on its economy, Olive Bio is facing a lack of access to finance with banks no longer providing loans, and a lack of access to funds and grants. "There is no help from the government and the NGOs have high requirements."

Kaaju was created in 2016, and it barely had a few years to grow before being hit by a wave of instability

KAAJU

Kaaju is a family-run enterprise that makes nut snacks, inspired by rich culinary cultures from South East Asia, West Asia, Africa and South America. Their products are 100 percent natural, gluten-free, paleo-friendly, small-batch, and vegan.

The father-daughter duo, Hassan and Alia Fattouh, were inspired to found Kaaju from the rich and varied meals of their home life. Alia's mother would often cook cuisines ranging from Asian, Middle Eastern, to African or European. Before dinner was served, the family would gather round for drinks and nibbles – always a selection of nuts.

Once, when Alia was on a trip to New York city, she struggled to find nuts which tasted as good as those of her family gatherings. From then on, she set out to begin producing her own roasted nuts, firstly with a mix of cashews and fresh curry leaves – a hark to a previous trip to Sri Lanka. She perfected the recipe and adopted it as a staple in her menus at every brunch, gathering, barbeque, or dinner party she hosted. It was met with success and so the idea was born to launch Kaaju, an environmentally and socially conscious social enterprise.

Kaaju was created in 2016, and it barely had a few years to grow before being hit by a wave of instability as Lebanon's economy began to teeter in 2019. Then, in 2020, the Covid-19 pandemic caused major economic setbacks for businesses everywhere. "We had to stop our business for a period of time, we couldn't distribute due to the blockage of the roads," Hassan says to Executive, referring to the road blocks resulting from anti-government demonstrations, as well as various pandemic lockdowns. "Also, these compounded crises led to an estimated drop in real GDP which made us stop importing for a while because of the high prices."

At the beginning, the co-founders started to participate in different food events in Lebanon; they presented their business idea and offered people tasters of their cashew mix. While Lebanon grows almonds and walnuts, nuts like pistachios or cashews are not locally grown.

In 2020, they began to develop their mix of flavors. Today they have five to six nut mixes: cashews with fresh curry leaves, wild lime or thyme, and almond or pistachios with rosemary. "Recently we released a new product which is a delicious blend of dry roasted seeds, nuts, and spices. We received great feedback on it," Hassan adds. "Every six months, we try our best to create a new flavor, but we work carefully because we are always keen to create a very special new delicious flavor."

Kaaju makes sure their product is healthy and true to its roots. Cashews are rich in copper, magnesium, protein, minerals, and antioxidants, while curry leaves are believed to support diabetes control and reduce bad cholesterol. Rosemary is believed to hold anti-aging properties, boost memory, and help reduce stress. The relationship between Kaaju and nature is strong, especially in mind when they create their recipes. The pair says they draw inspiration from the natural beauty of the country. Kaaju is now available in around 15 stores in Beirut, Matn, Keserouan, and north Lebanon, and online.

Clients are limited on their ability to buy artisanal products, and have a tendency to prioritize commerical items to save money

HABKA

We no longer talk in Lebanon about normal life in all its aspects. The economic and financial crisis has radically changed priorities; as people limit their food choices, putting health at risk as quality levels drop and safety specifications are ignored.

Organic agriculture is a production method that aims to achieve better food safety and security, as well as environmental sustainability. Nowadays, many people are choosing organic food in order to avoid chemicals used in farming, and to feel confident about the source of their food. Eating organically also means helping to create a healthier food system for everyone, from farm to table.

Hakba is a homemade basil-based pasta sauce, made by Nisreen Jaafar from her home in southern Lebanon. Under the mantra "Your health is your wealth", Jaafar created the product in memory of her late mother and touching upon the Arabic meaning of a basil leaf: "habka". The first half of the word means "love", and Jaafar says it is with love that the food is made.

Jaafar makes the product with organically grown basil to ensure its 100 percent naturally sourced, and so she can confidently label the product gluten and dairy free, though she admits homemade production is slow and demanding, but worth it. "Next time you're in the supermarket," she says,"pick a sauce jar and [look at] its label. You may be surprised by the few ingredients… Habka delivers on its promise of clean eating by skipping the additives, preservatives, and emulsifiers."

She makes four pasta sauces including a spicy sauce, as well as the classic pesto. In addition to the food lines, the product is eco-friendly, and Jaafar takes care to reduce her plastic usage. As part of the products sustainability promise, Jaafar designed a deal to offer cotton tote bags and basil seed bags, which helps to reduce single-use plastic, while the basil seeds help encourage people to plant at home. The sauces are contained in glass jars, for its recyclable quality. "Using glass reduces emissions and usage of raw materials – it can be turned into a new recycled glass object at any point. From a health standpoint, glass also wins over many other options as it does not absorb smells or flavors, and it does not leak any toxic substances into foods or drinks."

Like all startups, Habka is facing difficulties in the current economic climate. She says clients are limited on their ability to buy artisanal products, and have a tendency to prioritize commercial items to save money. "Delivery to points of sale or to individual clients has been very expensive and the business is not yet making much profit from having to spend so much on transportation," Jaafar says.

Pricing was the most challenging aspect for Jaafar when she began. First, when she started the currency rate was incredibly volatile so she could not properly estimate the value of her supply chain against the value of her product in its finished form. She wanted to position Habka as an artisanal product, yet an affordable one. After much deliberation and many consultations, she priced the items in Lebanese pounds, though the prices are revised periodically. "Eventually, I will want Habka to survive [but] without an acceptable profit margin, no business can survive," she says.

Food entrepreneurship

"The outbreaks we are experiencing recently in Lebanon and the high cost of food has prompted several Lebanese to contact us"

HYDREK

Hydroponic planting is the process of cultivating seeds without using soil, but instead using nutrient rich substances, oxygen, and water to grow herbs, plants, and flowers. It is an increasingly popular way to plant, and in Lebanon, more are turning towards hydroponic systems, as one young company Hydrek, has been discovering.

Hydrek was founded two years ago by Nabil Nehme, and the business provides hydroponic systems for households, farmers, plus customized systems for NGOs, and municipalities. They focus on home-scale hydroponic systems, green fodders, livestock farms, supermarkets, and groceries by providing solutions for individuals, companies, and governments.

"We are the first company leading climate control and hydroponic solution provider for corporates. Our turnkey solutions are unparalleled, from efficient installation to streamlined commissioning processes to superior or input supplies and grower management, [we are] bringing the future of sustainable growth within your reach," Nehme tells Executive.

It was over ten years ago that Nehme first considered the concept. "I'm from a village and I like planting. When we moved to Beirut, I didn't have enough space or a big investment so we started searching for options for planting on the balcony. While researching, I found that hydroponics is customized on a large scale (including big investment and space)." The discovery led him to found the start-up to offer home-scale hydroponics.

Nehme's approach also includes consultancy services, farm design, hydroponic feasibility studies, and agronomy training. The company also hopes that this type of horticulture will help mitigate the impact of climate change, as well as provide better food security, an issue Lebanon is currently battling with.

"The outbreaks we are experiencing recently in Lebanon and the high cost of food has prompted several Lebanese to contact us," Nehme says. "For example, by buying one unit from Hydrek, anyone can plant hundreds of cups of vegetables with limited water and without the need for electricity. Accordingly, he or she can meet their needs for a longer period at a lower cost."

Hydrek won a place on the Investmed project, an European Union funded program to support startups in the Mediterranean region, including in Egypt and Tunisia, as well as Lebanon. The businesses targeted should be working on economic and environmental challenges, with sustainability, facilitating access to new markets, and generating increased economic opportunities for men and women.

Nehme says the project will help train and coach Hydrek to become more competitive, and protect intellectual property rights. The team is made up of professionals experienced in working on greenhouse and automation technology projects, with a mixture of women, men and recent graduates, mainly agriculture engineers. Hydrek is located in the village of Kaa, in the Bekaa Valley, with the head office in Mkalles.

"Our charcoal is so beneficial to the refugees who live in unfitted tents and suffer from severe cold in winter, especially children"

JAMRA PLUS

In light of soaring black market fuel prices for heating, many Lebanese are no longer hesitating to chop down trees in nearby woods and forests, sometimes including those in nature reserves. With the onset of winter, people in both urban and rural areas are turning to firewood and charcoal to heat their homes. Cutting down logs for firewood is not a new trend in Lebanon, but it has been gaining momentum since the surging price of diesel.

Under the title "It is time to save the earth", a team of ambitious chemical environmental experts in the Bekaa Valley have created a startup, Jamra Plus, to sustainably innovate through coffee waste. After years of researching, trying and testing, Fatima Kanaan, Safa Ayoub, Houssein Ayoub, and Hosni Abdelghini Ismail, were able to start their business in January 2022 and create Jamra Plus. The company produces briquette charcoal products from coffee waste. Their business is in the Bekaa but they are keen to be present all over Lebanon.

"Thousands of trees are cut yearly in Lebanon for heat and food preparation, so we decided that from people drinking coffee, we could convert it into charcoal in order to protect and save our trees," says Fatima to Executive. They are currently working on opening a factory and purchasing equipment as well. In addition, they will be manufacturing their own machine in which their product can be used for cooking and preparation. At the moment, however, they are making do with their hands. First, they collect the coffee grounds and sawdust; next, they add some ingredients and mix them all together. Then they melt the briquettes which makes them ready for use. The charcoal can be used for more than one purpose, like to prepare food, to keep warm, for barbecues or for camping.

"Our charcoal is so beneficial to the refugees who live in unfitted tents and suffer from severe cold in winter, especially children," Safa mentions. Their charcoal also has environmental benefits, as well as humanitarian. It has 30 percent less carbon monoxide than standard types, and it burns fast with a strong flame. Since it is made of used and organic raw materials, it is price competitive too.

Jamra Plus has participated in different competitions, they ranked second place in the Hult Prize competition, which is a global, year-long competition that crowd-sources ideas from university-level students to challenge them to solve pressing social issues around topics such as food security, water access, energy, and education. They also ranked second place during the Lebanese-MED Researcher's Night event, which is an event to give researchers the opportunity to showcase science's impact on daily life, for projects focused around the Water, Food and Energy Nexus. Both Fatima and Safa stressed how a healthy environment was a priority for them, so much so they specify a part of their profit to plant trees in Lebanon.

ENTREPRENEURS TO FIGHT FOOD INSECURITY

Accelerators are designing new growth strategies for startups

The future of local food security heavily relies on the arduous efforts of policymakers and decision-takers to develop a nationwide roadmap and save what is left of the agro-food sector at the macro-, meso-, and micro-levels. It was inevitable that the connected events of the Lebanese pound's devaluation and US dollar shortage were going to have a detrimental impact on the largely dependent-on-imports sector. Agricultural imports account for more than 80 percent of food supply. The country does not only import food products but also a large proportion of agricultural inputs, like seeds, fertilizers, and pesticides. As a result, the agriculture and the food processing sector (agro-food sector) has been heavily impacted. But as the sector calls for help, the government has been failing to sufficiently respond, with the majority of the country's remaining public resources being allocated to the industrial and financial sectors, according to a 2021 paper, Agricultural Sector Review (ASR), by the Food and Agriculture Organization of the United Nations (FAO).

Since 2019, to contain a growing food security problem and in light of government absence, private sector and international NGOs have stepped up to address farmers' limited access to financing, poor infrastructure, the internationally-disrupted supply chain, and outdated farming practices. Long standing policy making inadequacy, alongside the dysfunctional Circular 331 - introduced in 2013 to encourage Lebanese banks to invest in start-ups, incubators, accelerators and venture capital funds - has pushed local incubators and accelerators to design new strategies to scale up and accelerate growth of micro, small and medium-sized enterprises (MSMEs). This also includes start-ups in the idea or early stages, and particularly those in the agriculture and the food processing sector.

HALF A BILLION DOLLARS IN FUNDING

According to the ASR, a high informal employment rate has always been an obstacle to the growth of the agriculture sector. Only a small share - around 8 percent - of the total agriculture labor force is formally employed, according to a 2019 McKinsey paper. Over the past couple of years, incubators have dedicated a lot of efforts to revive rural and culinary tourism in the countryside and focus on formalizing employment.

One notable ongoing program, funded by the German Federal Ministry for Economic Cooperation and Development, and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit in partnership with Berytech, is the Rural Entrepreneurs in Agri-Food program which aims to support businesses and startups in the sustainable rural economic development field. According to the Lebanon Agri-Food Initiatives Mapping and Gap Identification report developed by the Lebanon Reforestation Initiative, the current support for the sector reached more than $475 million. This support is channeled through international organizations such as the FAO, United Nations Development Program (UNDP), the World Food Program, the International Labour Organization, or through the World Bank and the European Union (EU). On the other hand, bilateral support to the agriculture sector is also provided by several countries like France, Germany, Italy, Holland, among others.

DISTRIBUTION OF FUNDING BY SUB-SECTOR

SUB-SECTOR	*BUDGET (MILLION USD)*
Rangeland management	7.80
Banana plantations	0.13
Business development	1.77
Good agricultural practices/ Pest management	251.6
Gender awareness	0.35
Greenhouse production	1.5
Landscape restoration	7.75
Livelihood	24.7
Planning, Quality Control, Research & Development	0.29
Value chain/business development services	175.0
Water sources management and rehabilitation	4.35
Grand Total	**475.26**

Source: The Lebanon Reforestation Initiative

BERYTECH: TECHNICAL AND BUSINESS SUPPORT IN RETURN FOR INNOVATIVE SOLUTIONS

Berytech designed the Agrytech program in early 2017 to provide financial, technical, and community support to start-ups and small to medium-sized enterprises (SMEs) with engineering and tech solutions across the agro-food value chain. Since then, the program is strengthening linkages among same-sector businesses. In response to the declining economy, in 2019 Berytech launched the Agri-Food and Cleantech (ACT) Smart Innovation Hub which aims to support innovation in the agro-food and energy industry for developing solutions around the increasingly present environmental and food security challenges. Berytech also hopes the program will have a long term impact on the entrepreneurial scene, by proposing policy reforms and establishing a lobbying structure.

Soha Nasser, an agro-food specialist at Berytech and manager of the special edition of the Agrytech Accelerator Program, says that the aim behind the Agrytech program is to help turn the local economy from a service-based economy into a manufacturing-based economy. By organizing outreach activities such as ideathons and hackathons, in partnership with different universities, Berytech helps entrepreneurs from the agro-food sector turn their ideas into viable and investment-ready businesses.

"The applicants for the special edition of the Agrytech Accelerator Program need to have a minimum viable product with a scalability potential beyond the local market and the potential to create sustainable job opportunities in the Lebanese market," Nasser tells Executive. To grasp the situation of the market and define gaps, Berytech's specialists team conducts a needs assessment survey.

SECTOR CHALLENGES

However, even though the sector is becoming more appealing to young Lebanese entrepreneurs, Nasser concedes that sometimes they have a hard time finding the right talent, especially due to the emigration of skilled youth since the start of the crisis. Berytech identifies some of the areas facing the most challenges: farming, food-industry packaging and marketing, rangelands and forestry, fishing and aquaculture, and the area of management support. Berytech encourages applicants to consider ideas for these fields as a top priority while conceiving their businesses in all activities including in the Hackathon and Accelerator Program. The main programs under the agriculture and food sector at Berytech are:

- **Agrytech**;
- **Bestmedgrape:** an EU-funded project that aims to help businesses turn their wine-making waste into health products;
- **Transdairy:** an EU-funded project that is enabling technological transfer among research, industry and SMEs applied to the dairy value chain;
- **QOOT:** an agro-food innovation cluster aiming to internationalize the local agro-food sector;
- **The Future Agro Challenge:** a global competition for food and agribusiness startups addressing national, regional, and global challenges.

Berytech helps entrepreneurs from the agro-food sector turn their ideas into viable and investment-ready businesses

FAIR TRADE LEBANON: HELPING FOOD PROCESSORS MEET LOCAL AND INTERNATIONAL SALES STANDARDS

Fair Trade Lebanon (FTL) is a local NGO created in 2006 with the aim to equip small producers and food processing cooperatives in rural regions with the needed skills to become export ready, through technical training and the acquisition of necessary certification to enter different markets. The local agro-food sector accounted for 11.7 percent of total exports, according to the last reported statistics in 2019, by the Investment Development Authority of Lebanon.

Accelerators are working closely with universities to source talents and help conceptualize ideas at an early stage

FTL has three projects running consecutively:

- **Support business innovation and enhance export for Lebanon (BIEEL):** a project targeting local agro-food exporting SMEs to enhance exports by improving access to international markets, equipping businesses with the right certifications to meet international market standards, and providing alternative financing solutions or export-enhancing loans. The main financing institutes are Cedar Oxygen Fund, IM Capital, Crowdfarming, and Al Fanar.
- **Shabake:** a program to strengthen the resilience of Lebanese civil society in order to improve crisis prevention and management programs, funded by the Agence Française de Developpement and implemented by Expertise France and FTL. One part of the project is supporting women's food processing cooperatives in the Bekaa by providing them with technical and marketing training.
- **MedArtSal:** an EU-funded project focused on the sustainable management of salt harvesting and artisanal salt production along the Mediterranean, including in Italy, Spain, and Tunisia, as well as Lebanon.

Other accelerators and incubators like Smart ESA, Bloom, and Nucleus Ventures are not providing customized support for agro-food businesses in particular, but are working closely with different partners to tailor support for the increasing number of applicants in all sectors.

BLOOM'S PERSONAL AND PROFESSIONAL BUSINESS ACCELERATOR

"Under the Lebanon Growth Accelerator (LGA) program, Bloom is collaborating with six other accelerators, to support 50 businesses and help create around 250 jobs locally," Dara-Maria Mouracade, programs lead at Bloom, tells Executive. Among the 50 participants who benefited from Bloom's support, Mouracade named nine businesses in the agro-food and agricultural inputs sector: Dooda Solutions, Garbaliser, Agro Cedrus, House of Lilies, Compost Baladi – Cultiva, SunCode, Del Libano, Melqart's Forest, and Aquavita. According to Mouracade, Bloom, in partnership with local and regional accelerators, incubators, and funds, provides mentorship programs for entrepreneurs to help them grow on a personal level all while supporting the growth of their businesses. The main challenges facing agriculture that Bloom wants to address under the LGA program are reducing the cost of imports, increasing access to finance, creating innovative ideas to outdated farming practices, and finding solutions to the disruptions in the agricultural value chain caused by the aftermath of Covid-19 and the current Russian-Ukrainian conflict.

NUCLEUS VENTURE: CONNECTING INNOVATORS TO THE WORLD

"Nucleus Ventures (NV) does not have a specific program addressing the food security challenge.

In partnership with Steve Wozniak, co-founder of Apple Inc., NV offers boot camps in the EMEA region [Europe, Middle East, Africa] and focuses on talent building for the most in-demand tech careers," Farah Chamas, Beirut's NV programs director, tells Executive. The crisis impacted the orientation of the support provided by the accelerator. "Before the crisis, NV adopted a sector-agnostic approach, which means that we were working with various businesses to solve the problems of multiple sectors. The crisis helped us become more sector-focused, we work on providing businesses with grants rather than convertible loans or other financial products and we prioritize working with SMEs in the renewable energy sector."

In the energy sector, NV helps implement the Energy Innovation Hub program, co-funded by the EU and UNDP. Accelerators from Nucleus Ventures help businesses with growth potential and in securing deals with partners around the globe. Besides focusing on acceleration, NV helps upskill local talents through courses and programs. Under the multiple programs that NV is providing, beneficiaries in the agro-food sector include Bubble Kitchen, Aquavita, CaraBio, Suncode, and Partners with Sun.

WHICH PROGRAM TO CHOOSE?

Choosing the right accelerator program to match your business might leave you flummoxed, but the different outreach activities that accelerators launch online may help entrepreneurs anticipate what to expect. In addition, accelerators are working closely with universities to source talents and help conceptualize ideas at an early stage. ESA's Business School Accelerator, Smart ESA, customizes solutions for entrepreneurs from all sectors and provides different programs for businesses starting from the seed stage to the expansion stage.

However, despite the growing attractiveness of the agriculture sector among the emerging generation of entrepreneurs and the range of accelerator programs, there is also an issue of mismatch between the offer and the demand; sometimes the offer is not very much aligned with the demand. For instance, apple growers struggle to sell their high-quality fruit every harvesting season and still no concrete solution has been provided, on a governmental level or even from an innovative business approach.

Global and local trends have been driving the need for innovation in the agriculture and food processing sector long before this year's food security debate kicked off. Without a doubt, at this moment in time, with the increasing number of accelerators, incubators and enthusiastic participants, being a disruptor in the agro-food sector is critical to address the sector's poor infrastructure, specifically with rising concerns over polluted water, food poisoning, and arbitrary decision making.

By Thomas Schellen

SEEKING EXITS FROM OBTRUSION

Financial access impediments remain a lingering barrier for agro business

What can illustrate the relationship between the farmer and the banker in this country? To modify an old consultant joke to a Lebanese scenario, let us assume – purely for the sake of illustration – that a banking guru with decades of expertise in maintaining monetary immobility at the heart of the financial system, decides to depart from his impoverished neighbors by means of a trusty hot air balloon. His hypothetical rationale: our financial wizard thinks that such a balloon is an inconspicuous means of personal transportation which does not require an airport for takeoff, plus he has lots of skills in producing hot air.

A magical fog surprises the maestro when he tries to cross the hills. The balloon drifts northeast in this dense fog and floats into the upper plains of the Baalbek-Hermel district where it gets entangled in an inactive power pylon. Then the fog breaks and the disoriented guru sees a farmer working in a field 40 feet below his aerial contraption.

"Habibi, can you help me?" cries the guru from above. "Get me down and sell me your car. I will give you a Eurobond that is worth 20 times what you paid for that car!" The farmer shakes his head and continues with his potato harvest. The financier tries again. "Please, can you drive me across the border? I am a rich banker and can even give you a blank check." The farmer shrugs. "At least tell me where I am exactly. I will pay you a million lira," begs the banker.

The farmer looks up and says: "It seems to me that you don't know much. I am an honest man and we do honest work here in these fields, so I cannot take the risk of driving you. Also, I need my car to take these potatoes to Beirut where they sell today for two million lira per bag." (Note: The scene plays out in the not-too-distant future.)

"And where you are is in that little basket hanging way above my head. I tell you that for free," the farmer concludes and continues with his work.

AN OLD CHASM

The distance between Lebanon's – currently very theoretical – top tiers of finance and – the very real – agricultural sector today does look insurmountable. But the access-to-finance chasm for rural investment needs has already been gaping wide for decades. It was composed in one sense of the conventional rift between those seeking after funding and those providing access to it, in exchange for collateral that they could understand and valorize. However, the gulf between lenders and farmers might have been deepest and widest in terms of mindsets and attitudes where prospective investees and the gatekeepers of lending and investments have for decades failed to find a common language and mutual comprehension.

Illustrative of this mental and material chasm is the share of rural Lebanon in banking sector deposits. According to Banque du Liban figures cited by Bank Audi's Lebanon Weekly Monitor for week 46 of 2022, the combined share of bank deposits by "region" rather than Mohafazat showed a heavily uneven concentration of two thirds of deposits in Beirut and its suburbs as of June 2022, juxtaposed at the other extreme with 5 percent of deposits in the Bekaa region.

According to numbers in the 2020 Annual Report of the Association of Banks in Lebanon, the regional distribution of deposits shifted down by about 30 basis points in Beirut and its suburbs, and up by a mere 13 basis points in the Bekaa in 2020 when compared with 2019. In terms of bank loans, the values were even more divergent as the capital reported to have been the location of between 73 and 74 percent of all

loans. The Bekaa was seeing the least lending activity in the country, only improving from 3.3 to 3.6 percent of credit that has been extended to borrowers in this region, which is stretched across several administrative Mohafazat, or governorates.

The access-to-finance chasm has never been completely hopeless in the sense that funding and farming could never be paired. One can find 10 percent of loan allocations to agricultural projects in the portfolio of Bank du Liban-subsidized loans in the early phase of its, ultimately ill-fated, economic stimulus packages of the 2010s. Also, data from Kafalat, a local financial company, show that the loan guarantee corporation in its heyday engaged with agriculture sector lending as one of its constituent, but far from dominant activities. For the period between 2001 to 2016, Kafalat data show issuance of loans to agriculture in the billions of Lebanese pounds – when one billion pounds equaled approximately $667,000. To cite the values in 2016, subsidized interest medium- to long-term loans with Kafalat guarantees in that year comprised LL652 billion ($432.57 million) of which LL62 billion, or 9.5 percent, had been awarded to agricultural loan applications (versus LL590 billion to industry and tourism).

In the context of access to finance by agriculture, one has to note further that the banking branch density in Lebanon has shown retail network growth as largely bypassing rural areas. One can see as proxy indication for the persistently underwhelming access to finance in the interest of agricultural development. Banking density - albeit on a long-term declining trajectory from 27 in 2004 to 20.3 in 2020 (the latest available data in a World Bank series on this indicator) in terms of branches per 100,000 adults, was in 2020 still nearly twice the global value of 10.8 and higher than reported national branch densities in both the MENA region (13.4) and high-income countries (18.5) – has since the 1990s been considered exorbitant in comparison with peer countries but at the same time notorious for being domestically unequal and tilted heavily in favor of the capital Beirut and its conurbation.

The trends of concentration of deposits, loans, branches (also including ATMs) away from the Bekaa region and rural Lebanon have been consistent throughout the 2000s and 2010s. If historical access to finance and banking density in rural districts are further contextualized with soft infrastructures that facilitate the access to education for agricultural stakeholders, the conventional wisdom approach says that agriculture has an incredible amount of catching up to achieve with regard to both affordable financial capital and highly trained human capital. This need for closing the dual capital gap, which predated the collapse, has been highlighted in the past three years by the rising emphasis on building up the real economy. But it is also beyond question that commercial banks, which have lost the ability to lend, have since the start of the crisis been even less conduits for investments into agriculture, than before the banking collapse.

IMPORTANCE OF NEW INFRASTRUCTURES

Soft infrastructures for the agricultural value chain in a regulated market environment will be anchored in clear property legislation and a tax regime which entail cooperative and usufruct provisions. In terms of labor law, agriculture has to be covered by state frameworks of labor regulations and social protections.

Besides adequate legal infrastructure, state-supported education is recognized as another pillar in the enabling environment of the agricultural sector. The breadth of the educational choices in a country with a focus on elevating its agricultural sector will necessarily extend from vocational training to technical schools and university-level programs on crop and soil management, and agricultural and environmental sciences. Flanking tertiary education, strong value-adding potential can be unlocked by improving the collaboration between academia and industry in matters of agriculture and food processing.

State-supported education is recognized as another pillar in the enabling environment of the agricultural sector

In any country, educational and human capital infrastructures are in rural areas, almost by definition in perpetual need of updating and upgrading. This development focus is on one hand, directed toward keeping the sector aligned with new insights and studies in the constantly progressing realm of agriculturally applied life sciences where the human understanding of nature remains forever incomplete.

On the other hand, producer countries seeking to improve their agricultural exports have to constantly adjust to changing standards and requirements for internationally traded food stuffs and best practices. This latter challenge has long been a barrier standing large against Lebanese agricultural and agro-industrial exports to developed markets.

Overcoming this barrier requires investing in technicians and testing labs on the part of institutions, plus nurturing of awareness and compliance on the producer side. Moreover, under the aim of increasing a country's food security, capacity building in the supervisory framework and improving producer standards have to be correlated with efforts to reduce food wastage in the domestic market and increase nutri-

tional literacy among local consumers.

In this context, spreading awareness on nutritional values of food products and informing future Lebanese consumers about potentially harmful ingredients in popular snacks has this year become the chosen task of the Lebanese Association of Food Scientists and Technicians (LAFS), says Rana Cheaito, a food technician who has been coordinating the activities of LAFS since the mid-2010s, and recently was appointed as the head of this non-profit association.

"We are a bridge between industrialists and scientists," she explains. "Our objective this year is to do awareness campaigns on how to read labels attached to food products," Cheaito tells Executive. In parallel to having initiated a reading-the-labels campaign in schools, LAFS continually interacts with very small businesses – micro-enterprises in food processing and people who make food products in their home kitchens – to build their awareness on good manufacturing practices and food safety, Cheaito says.

This public good of food security and the collaboration among stakeholders have been pursued by LAFS on the level of a volunteer-driven NGO since the organization's establishment in 1999; and this task was primarily tackled through annual conferences. Over the years, there were several highlights in the organization's interaction with public officials, but the collaboration with public institutions such as the ministries of industry, agriculture, and economy has yet to be solidified beyond statements and expressions of ministerial intent. However, it is notable that since the economic crisis the membership of LAFS has been subjected to brain-drain pressures; nearly half of its 18 members have taken up roles in academia or industry overseas.

Lebanese food security, in Cheaito's view, can be improved significantly with a roadmap for agriculture sector strategies and investments, but it is a precondition that more food scientists are employed by both agro-industry and public sector. "We have recommended that food safety quality controls should be mandatory at every food [processing] firm," she says, commenting that this recommendation, which was adopted by the Ministry of Economy and Trade in a statement at the LAFS annual conference of 2019, has yet to be transformed from an idea to reality. But according to her, this is not for want of trained technicians. "I can tell you that we have enough food scientists and experts, but we don't have enough who are employed."

Cheaito also concurs that there is a need to strengthen the pre- and post-harvest agricultural infrastructure of Lebanon with more testing laboratories. "We have the experts, the lands, and the produce, but we don't have enough labs and testing materials," she says, adding that private sector investments and operational partnerships between the concerned ministries and academic institutions are the most realistic path.

BACK TO FINANCE

The landscape in terms of soft infrastructures of education and resident expertise is in need of development, and the legislative and regulatory infrastructure for agricultural growth seems hardly sufficient, but today, the most deficient soft infrastructure remains access to finance. At the time of writing towards the end of 2022, when there is no bankable reversal in the Lebanese state's presidential stupor yet, the state's disability for enacting reforms and reaching agreements with all the International Monetary Fund (IMF), development finance institutions, Eurobond holders, domestic creditors, and depositors means that restoration of an access-to-finance capability and institutional infrastructure is not a rational near-term expectation for the agriculture or any other sector.

From the start of the financial crisis until today, private sector actors have been diverting their business transactions away from local banks, while households have made the informal economy their habitat, and the direct channeling of foreign financial aid circumvented the state and the banks in favor of dealing with small initiatives led by civil society organizations. The latter shift toward unconventional financing on the basis of micro-economic partnerships between foreign donors and Lebanese civil society organizations and NGOs is especially prominent in agricultural and green development projects.

In terms of developing the agro-food economy,

an orderly return of conventional banking or the occasionally proposed establishment of a state-owned agricultural bank, both presuppose banking reform. Moreover, there is consensus among financial analysts and strategists that recovery of investor's trust and the hope to see the channeling of funds into Lebanon through commercial banks will remain confined to the realm of hopeless dreams until an IMF agreement is in place.

Among few access-to-finance avenues that were not under complete capture by commercial banking, the microfinance sector, after the microcredit tradition of Mohammed Youus and the Grameen Bank initiative, has been rising in Lebanon since the early 2000s, albeit rather slowly by comparison with many developing economies.

The oldest microfinance institution (MFI) in Lebanon which still is operating under an NGO status, is Al Majmoua. Formed in the 1990s with a mandate to serve low-income businesswomen, the organization evolved in the 2000s into a leading MFI providing microcredit to urban and rural women and men who were seeking to secure independent livelihoods. Lately, in the course of the financial and economic crisis of Lebanon, the organization has identified agricultural clients as a new priority target group, Al Majmoua's executive director Youssef Fawaz tells Executive.

"We have for more than 18 months [been] looking again into green financing and we also have been trying to be more involved with agricultural finance," he says. An agreement testifying to the new orientation of Al Majmoua was signed in October with the multi-partner initiative WE4F; and the agreement will see the Lebanese MFI develop a financing product designed to help farmers obtain solar-powered irrigation systems.

Before the crisis, Al Majmoua had expanded its client base to 90,000 borrowers – absent a license that would allow it to accept deposits – whom it served with a staff of nearly 1,000. The vast majority of these borrowers were not agriculturalists. "Our portfolio reflected the economic pie in the country, with a bias to women-led ventures. The bulk of micro-loans was in trade and services sectors, with ten percent or less in the agricultural sector," Fawaz explains.

In the crisis, the MFI's headcount atrophied to about half of its pre-crisis staff of 450. Its deployable financial resources suffered the same fate as those of every funder. A large share of its funds in bank accounts were denominated in dollars and became inaccessible. Also, as the MFI shifted to receiving lira payments from its loan clients after demand for its credit dropped in the early phase of the crisis, it soon started to have difficulties in even accessing these lira in its accounts. "The funding has completely dried up. We have been in crisis mode for more than three years," Fawaz says.

Without mincing words, he describes the MFI's financial and human capital conundrum, putting the financial capital need at $5 to $6 million. "We are in a difficult situation and need to start climbing again. The challenge is that to climb again seriously, we would need new capital to come in, so that we can again lend in dollars. My plea to whoever wants to listen is to help save the sector of microfinance," Fawaz says, arguing further that Al Majmoua could leverage its proven track record as a financially sustainable microcredit provider with good prospects for delivering returns to investors. "Microfinance is a sector that can reach 100,000 clients in the most remote areas of the country from the north to the south and the eastern Bekaa. We have the scales, the track record, and the history and we have the human infrastructure," he enthuses.

> "We have the experts, the lands, and the produce, but we don't have enough labs and testing materials"

On this, the hopeful side of its business Fawaz names two non-financial assets. The first is the observation that the MFI has recently noted a burgeoning recovery in people's desire to borrow, and the second that the level of human capital has been preserved at a level where a rapid restart of the microcredit activity will be possible. The current staff level of "slightly less than 250 is still good and we remain relevant, as we have 32,000 clients," Fawaz says.

He emphasizes that this level needs to be maintained in order to preserve Al Majmoua's ability to re-engage clients in a coming economic recovery period with credit, technical assistance, and financial literacy training activities. "If experienced and skilled MFI workers were to be dismissed because of payroll difficulties, it will really be a missed opportunity for the period after the organized launch of a recovery strategy. I could lay off another 100 people tomorrow. But then, on the day when you decide that you want to reach 100,000 clients, it will again take us 15 years to get there."

The fact that microfinance – when compared with commercial banking and larger-scale investment facilitations – is today a sector with outstanding reach potential for serving rural smallholders and micro-entrepreneurs in the agricultural economy, adds urgency to Al Majmoua's social and economic appeal.

By Thomas Schellen

MANY TREES IN THE GARDEN

The role of niche producers

It is much more than a vague, billion-dollar opportunity for growing cannabis. Lebanese agriculture today is a field with many plots whose diversity has already grown when compared with some five years ago. That was the time when political statements – and an expensive report – were drawing people like moths to the light to the idea that legalized cultivation of the cannabis plant would be a recipe for economic growth and could quintuple and formalize the estimated annual $200 million economic output of illegal hashish farming in the farthest reaches of the Bekaa valley.

Actually, there is no reason to think that further steps in legalization of cannabis cultivation in Lebanon (after the adoption of a law on its medical use in 2021) would not contribute to the economy's recovery. But always advisable investor caution notwithstanding, the economic growth potential of cannabis as cash crop is immense, judging from the experience of the developing weed markets of North America – where estimated legal retail sales of marijuana for medical and recreational use in the US alone quadrupled from a low base of $3 billion in the five years from 2015 to 2019 – and from the – as usual, biased on the sales side – commercial research projections of a US market that could break $50 billion in retail sales around 2026. Moreover, and very important under Lebanese cultivation perspectives, there are the expectations of multi-billion-dollar legal cannabis sales (pending legalization) in Europe in the coming decade.

Considered against such market outlooks especially in Europe, the legal growing and processing industry potential in Lebanon may be quite impossible to quantify today. This means that economically forgetting or politically dismissing the weed option in agricultural development scenarios would be extremely counterproductive to hopes for optimally developing the agricultural sector by building a cannabis value chain and exportable cannabis product portfolios from the medical to the recreational.

A PONDERABLE PONDER

But while local proponents and seekers of an agricultural renaissance might not want to wait for these potent European cannabis markets to come online and certainly would not want to wait for the relevant legislation to move forward in Lebanon, there are two other areas that deserve attention.

The excessive reading of studies and strategy papers on Lebanon's agricultural potentials and policies could raise the specter of a bad déjà vu, with sagely statements such as this: "Support to the agricultural sector should include improving marketing and distribution schemes, intensifying promotion, finding new markets, enhancing research, imposing pest and disease control, improving training and extension services, providing inspection services, and boosting infrastructural services related mainly to electricity and water supply."

This sentence applies today yet it stems from an electronic file saved in 2004: it was written as a draft assessment of the EU-Lebanon Association Agreement of 2002 that was reached under the umbrella of the 1995 European-Mediterranean Partnership (Euro-Med Partnership) declaration and program. "Development of the agricultural sector will not only benefit the rural population but will also promote Lebanon's overall economic status," the Euro-Med assessment said, declaring that the "agricultural sector plays a multiple role in the Lebanese economy."

Pouring over the paper, the first notion to strike are the macro-level and agricultural parallels between the current time and the turn of the millennium. For example, the GDP then stood at $19.5 billion (a cited IMF estimate for 2004) versus the World Bank's latest forecast of a 6.5 percent contraction in 2022 from last year's $22 billion estimate, albeit shared by a much larger number of people in Lebanon. What makes the past 20 years feel like a lost generation specifically in agriculture, are statements where the assessment of the early 2000s points out baseline realities – such as the fact that land resources for agricultural use are limited to about a quarter of the small country and encroachment of urban sprawl – and structural factors that appear as true and relevant today as they were then. About the structure of the agricultural sector, the paper noted that 73 percent of Lebanon's 248,000 hectares land under cultivation by 195,000 farms were smaller than one hectare.

In policy assumptions and evaluations of Lebanese agriculture in the 2004 paper and also in papers published in the intervening years up to the 2020 crisis, the analysis and recommendations based on the sector's fragmented structure tended to focus on factors that are commonly associated with specialization, intensification and corporatization of agriculture. A 2018 brief by World Bank experts on agricultural developments in Jordan and Lebanon, for example, in the seeming approval attributed agricultural output growth in both countries to "increasing labor and land productivity as well as use of chemical fertilizers." Similarly, Lebanon's National Agricultural Strategy for 2020 to 2025 advocates as first point among four in the second pillar of its five-pillar approach to "increase agricultural production."

From the perspective of changing priorities, papers advocating Lebanese agricultural development while combining data on the persistence of baseline scenarios that do not change with advice that reminisces of the old agricultural priorities of economies of scale, speak to the need for policy change at all levels of government. It is a reminder of the eternal story that the most detailed studies, exhaustive special reports, and politically correct strategies are nothing but refuse after their shelf life has expired without their insights having been heeded and translated into action.

A LARGE ORGANIC NICHE, PLUS GOAT ECONOMY AND CIDER CULTURE

The second area worth pondering on the future of Lebanese agriculture in conjunction with strategic changes and new entrepreneurial impulses is hopeful and totally tangible. It concerns viable new niches which are distinct from the hypothetical recreational cannabis niche in being less obvious in growth potential, but positively nutritional and legal.

These unconventional new paths to growth include ones that are based on circular economy wisdom of generating valuable resources out of residues such as olive pulp and grape pomace, producing energy from biomass – organic matter used as fuel – and employing principles of agroecology (see expert contributions in the special report on food security) and have been pioneered by scientists and civil society "pathfinders". But these paths run parallel to commercially discovered trails which have been explored by innovative producers who have been venturing forward along contrarian routes in the agro-food sector.

Perhaps the broadest of these commercially explored trails in Lebanon is that of organic agriculture. It is especially suited for a country where past certainties on the availability of subsidized electricity, fuel, and water, as well as the heavy reliance on imported chemical fertilizer have turned into substantial problems. "Organic farming relies on using fewer external resources, so less electricity and water and less inputs and raw material in the production process. Instead of fertilizers we use our own composting and instead of propagation we use our own propagation," Mario Massoud, executive manager of the Lebanese agriculture sector enterprise Biomass, tells Executive.

These unconventional new paths to growth are based on circular economy wisdom of generating valuable resources out of residues

When the family venture in 2010 transformed into a commercial enterprise seeking to bring organic products to the domestic market, its business mantra was that Lebanon makes for an interesting country to practice organic agriculture in. These reasons, as cited by Massoud, started with the territory's well-known characteristics of 300 days of sun per year, by comparison to regional peers' excellent access to water, and 18 microclimates and crop production windows.

After eight years of building up the business, the production company operated three fully owned farms and worked with 55 partner farms that had dedicated themselves to organic farming standards. This enterprise structure changed during the crisis years whereby the number of owned farms grew to 15, and the number of partner farms dropped to 35 at time of this report. At the same

time, the impact of the crisis narrowed the cost disadvantage that its branded and packaged produce and processed foodstuffs had versus conventional produce and products.

"Somehow, organic became more competitive [in comparison with] conventional farming, because it uses less imported inputs and raw materials," Massoud says, though he laments that due to the crisis, the costs of storing fruits, such as apples, from the 2022 harvest would in some cases exceed the prices that these fruits would fetch in the market. Likewise, the cost of the box which Biomass branded fruits and vegetables are sold in has been thrown out of whack in relation to its contents.

In terms of the structural change of the Biomass operation, which was driven in a large part by the fact that many farming partners sold their equipment during the crisis, Massoud reveals that the shift towards owned farms came with a loss of production. "We used to cover about one million square meters, [or] 100 hectares, of organic farming with our farming partners. We took more farms, but we lost farming partners and today we cover 40 hectares. The farms that we took, are smaller in scale," he explains.

On the positive side, Massoud says that the crisis has emboldened the organic orientation of Biomass and led the company to assess the total market potential of domestic consumption and exports as strong enough to turn more farms into organic operations with full certification and standards. According to him, the target size for production is now 5 million square meters, or 500 hectares.

However, in his view, neither the organic niche nor conventional farming will be able to accomplish a full or large-scale substitution of food imports. But after decades of underinvestment, organic farming is Massoud's hope for a new start out of the country's economic crisis. "What we are trying to do as a company, is to modernize the farming approach and to promote sustainable farming techniques in Lebanon because we believe in this concept and also believe in the commercial potential of doing this."

Besides the promises of wildly fashionable niches that are linked to developed markets' buzzwords, such as bio and weed, some hitherto neglected native niches of Lebanese agriculture also correlate well with the demand trends and quality requirements of the developed world.

One such specialty sub-sector of the dairy economy is the goat economy of Lebanon, as promoted by Andre and Joelle Hajjar, siblings who invested in their family's Go Baladi production of goat milk cheeses and yogurts. When the family enterprise was set up in 2015 in a father, daughter, and son collaboration, the rationale was to substitute goat milk for cow milk because of the human health advantages of goat milk. What sets Go Baladi – the brand is a clever play on words – apart in operational terms is its sustainability focus in sourcing milk from smallholder goat herders who graze their herds in rural areas, such as the Chouf mountains and the Bekaa valley.

The company behind Go Baladi – Hajjar Foods – does not own farms and does not rely on imported goat stock, and its cooperation with herders of free grazing and migratory flocks means that the venture is faced with a reduced need for imports such as feeds, CEO Andre Hajjar tells Executive. "I consider goat milk to be part of the traditional wealth of Lebanon," he enthuses.

As with all things agriculture in Lebanon, needed imports and absent state incentives stand as barriers against improving the goat economy. However, on the upside, Hajjar points to marketing potentials of high-quality goat milk products in Arab countries where free grazing of herds is not possible. He envisions that up to one million goats could be kept in wandering flocks in rural Lebanon, which would signify a more than 100 percent growth potential of the goat population, as estimated in studies.

Massoud says the crisis has emboldened the organic orientation of Biomass and led the company to assess the total market potential

Go Baladi, which halted their formal marketing activities in 2019, faces the usual challenges of consumer purchase power limitations that are juxtaposed with unpredictable inflation pressures. Hajjar declines disclosing initial investment and current financial results of the privately held company, but says that against the environment of a sector where large dairy companies are shrinking, Go Baladi never stopped growing in economic terms. At the start of its operation, the venture received foreign development agencies' advisory and funding support.

Yet another lifestyle, healthy drink and tart taste trend that has contributed to the niche diversity of Lebanese agriculture is Wata, a pioneering apple cider made from fresh fruits and a rural production. Founder Soha Frem started her cidery not

as an entrepreneur who ran the gamut of incubator or accelerator, seed funding or angel funding, but as someone who ventured out with her own savings and her husband's operational management support and orchard in the coastal hills of the Keserwan district of Lebanon.

Frem tells Executive that at the time of starting her cidery in 2019 – two months before the civil protests of that October – there was no real sense of a cider product in the Lebanese market, to the point that it was not and still is not quite possible to define the addressable market for these healthier ciders as alternatives to other beverages, because the cider market in Lebanon is new. She says that Wata, due to minimal competition by imported ciders, started out with a quasi-monopoly on the market, and continues holding this advantaged position until today. But what really mattered to her was the fact that Wata worked toward creating a cider culture in Lebanon, and "being able to introduce a new experience to Lebanese daily life."

As to Wata's organic limits to growth, she explains that cider shares many of the same barriers that inhibit mass production in other agro-food segments. Agricultural producers are able to generate high quality products "but in order to be competitive, we need to produce mass products," she says, adding that comparative advantages in term of production cost are currently near impossible to realize due to the agricultural sector's lack of infrastructure, the cost of water and energy.

Other restraints against upscaling of production are the need to import nearly all inputs. In th case of Wata, this is yeast, yeast nutrients, caps, bottles, labels, and all packaging materials; only the apples are sourced locally. But essentially it is the quality focus and method of Wata's production that prohibits outputting cider in mass, something that can be easily achieved with ciders produced from concentrate. "Cider produced from fresh apples will never be a mass product, because production is expensive," she says.

Conceding Wata's admittedly limited experience in exports, Lebanese cider has a very good export potential, she says. "We started exporting to Norway, Switzerland, and Paris, [France]. And what I have seen is that markets that are interested are high-end markets that are looking for quality, looking for craft ciders, and for stories behind the product. They are looking for brands that are really taking care of their fruits and we tick those boxes," Frem says.

In economic literature, economies of scope in an agricultural enterprise are described as emerging when the farmer or agro-entrepreneur uses the same inputs in two or more products, and thereby lowers the cost of their production. Under this approach, farm diversification has been established as a path to reduce market risk and also to improve resources usage at the farm. The logic of agrarian economies of scale mandates investments in infrastructure and centralized marketing structures as tools in creating competitive advantages. The logic of agrarian economies of scope is to reduce food loss, produce better quality, with more care, price in costs, and invest into more diversity and quality, which raises the value of products.

Hajjar points to marketing potentials of high-quality goat milk products in Arab countries

Applying economies-of-scale strategies, it is beyond obvious that investment in water, electricity, transport, and specialized agriculture sector infrastructures are vital for improving food security and improving the economic performance of rural Lebanon. Shorter food supply chains, making and marketing of high value-added products, and economic and social network building and clustering are global winners that combine organically and optimally with investments in modest economies of scale.

By adding in an equal or larger emphasis on economies-of-scope practices, can the Lebanese agricultural constituency elevate itself into a nationwide integrated economic ecosystem of newly invigorated agro-entrepreneurship, family enterprises with niche expertise, and perhaps even corporate players with a sustainability focus? It may be a very worthwhile direction for a small, intense, and diverse agro-food ecosystem.

BUSINESS ESSENTIALS

EVENTS

CONFERENCES

	ORGANIZERS	CONTACT	WEBSITE
LEBANON			
6 Dec	**ACCESS MASTERS** Advent Group	candidates@adventgroup.net	www.adventgroup.net
7 Dec	**ONE-TO-ONE MBA EVENT LEBANON** Advent Group	candidates@adventgroup.net	www.adventgroup.net
6-7 Jan	**INTERNATIONAL CONFERENCE ON MEDICAL AND HEALTH SCIENCE** The Institute of Research Engineers and Scientists	info@theires.org	www.theires.org
20 Feb	**MODERN TIME MANAGEMENT SKILLS - ONLINE WORKSHOP** I Have Learned Academy	+961 36144 93; info@ihavelearned.me	www.ihavelearned.me
UAE - DUBAI			
5-8 Dec	**THE BIG 5 HEAVY** dmg :: events	+971 44380355; info@dmgevents.com	www.thebig5.ae
6-8 Dec	**MIDDLE EAST BUSINESS AVIATION ASSOCIATION** Ilikevents	+982 146129013; info@ilikevents.com	www.ilikevents.com
7 Dec	**DELL TECHNOLOGIES FORUM** Dell		www1.euro.dell.com
12-16 Dec	**EXECUTIVE MINI-MBA IN BANKING MANAGEMENT** The Management Centre	yvette@managementcentre.co.uk	www.themanagementcentre.com
16-18 Dec	**MARKETING 2.0 CONFERENCE DUBAI** Marketing 2.0 Conference	contact@marketing2conf.com	www.marketing2conf.com
19-20 Dec	**VERTICAL FARMING CONFERENCE** Curtis Wyss	registration@curtiswyss.com	www.curtiswyss.com
21-22 Dec	**INTERNATIONAL CONFERENCE ON NUCLEAR GOVERNANCE, ECOLOGY AND ECONOMY** World Academy of Science, Environment and Technology	-; -	www.waset.org
26-27 Dec	**BIO ENERGY, BIOFUELS & GREEN ENERGY SUMMIT** Science Technology Engineering and Mathematics/Management International Organisation	+658 4644650; secretary@stemio.org	www.stemio.org
28 Dec	**INTERNATIONAL CONFERENCE ON GLOBAL ECONOMY IN BUSINESS, MANAGEMENT, SOCIAL SCIENCE AND HUMNAITY PERSPECTIVE** International Institute for Research in Science and Technology	info@iirst.com	www.internation-alconferencealerts.com
9-13 Jan	**OIL MOVEMENT, STORAGE & TROUBLESHOOTING** Euromatech Training and Management Consultancy	+971 44571800; info@euromatech.ae	www.euromatech.com
11-12 Jan	**METAVSUMMIT** METAVSUMMIT	info@metavsummit.com	www.metavsummit.com
15-16 Jan	**INTERNATIONAL CONFERENCE ON COMMUNICATION MEDIA, EDUCATION RESEARCH AND BUSINESS MANAGEMENT** IBSSH	contact@ibssh.org	www.ibssh.org
UAE - ABU DHABI			
5-6 Dec	**ACAMS MENA CONFERENCE** ACAMS	-; -	www.acams.org
5-8 Dec	**ACS/IEEE INTERNATIONAL CONFERENCE ON COMPUTER SYSTEMS AND APPLICATIONS** Ozyegin University	info@ozyegin.edu.tr	www.ozyegin.edu.tr
10-13 Dec	**ARC MIDDLE EAST** BOND Events Ltd	+442 084323466	www.bondevents.com
11 Dec	**ACCESS MBA ONE-TO-ONE EVENT IN ABU DHABI** Advent Group	projectmanagers@adventgroup.net	www.adventgroup.net
12 Dec	**CLIMATE FINANCE AND TECHNOLOGY SUMMIT** India Inc. Group	info@indiaincgroup.com	www.indiaincgroup.com
12-14 Dec	**MENA INDUSTRIAL GASES CONFERENCE** Gasworld	+441 872225031; conferences@gasworld.com	www.gasworldconferences.com
2-3 Jan	**INTERNATIONAL CONFERENCE ON ECONOMICS FINANCE AND ACCOUNTING** Academicsera	+919 692200892; info@academicsera.com	www.academicsera.com

	ORGANIZERS	CONTACT	WEBSITE
SAUDI ARABIA			
4-5 Dec	**INTERNATIONAL CONFERENCE ON SMART COMPUTING AND APPLICATION**		
	University of Hail	icsca@uoh.edu.sa	www.icsca2022.com
5-6 Dec	**RETROFITTECH KSA**		
	Advanced Conferences & Meetings	+971 45631555; opportunities@acm-events.com	www.acm-events.com
5-6 Dec	**SAUDI CLOUD COMPUTING CONFERENCE**		
	GM Events	+971 45687800; info@gmevents.ae	www.gmevents.ae
6 Dec	**SAUDI ARABIA GOVERNMENT CONGRESS**		
	IDC CEMA	-; -	www.idc.com
7-8 Dec	**SAUDI ARABIAN FAMILY ENTERPRISE FORUM**		
	Campden Wealth	dominicsamuelson@campdenwealth.com	www.campdenwealth.com
8 Dec	**IDC GOVERNMENT CONGRESS SAUDI ARABIA**		
	IDC CEMA		www.idc.com
12-14 Dec	**SAUDI ARABIA SMART GRID CONFERENCE**		
	Saudi Arabia Smart Grid	+966 126505050; info@saudi-sg.com	www.saudi-sg.com
14 Dec	**IDC CLOUD & DATACENTER ROADSHOW**		
	IDC CEMA	-; -	www.idc.com
13-15 Dec	**RELIABILITY & MAINTAINABILITY CONFERENCE & EXHIBITION**		
	Energia Middle East	+971 585901294; info@energia-me.com	www.energiame.com
9-11 Jan	**INTERNATIONAL OPERATIONS AND MAINTENANCE CONFERENCE**		
	OMAINTEC	+966 114602332; Info@omaintec.com	omaintec.com
11 Jan	**DELL TECHNOLOGIES FORUM**		
	Dell	-; -	www1.euro.dell.com
15-16 Feb	**INTERNATIONAL CONFERENCE ON MANAGEMENT AND INFORMATION TECHNOLOGY**		
	Academics World	+917 077656338; info@academicsworld.org	www.academicsworld.org
BAHRAIN			
4-8 Dec	**MENOG FORUM**		
	Menog	+971 43649459; menog@menog.org	www.menog.org
5 Dec	**IFN & BIBF BAHRAIN**		
	Red Money Events	infoevents@redmoneygroup.com	www.redmoneyevents.com
10-11 Jan	**INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE**		
	Researchfora	+919 078053939; info@researchfora.com	www.researchfora.com
KUWAIT			
13-14 Dec	**MEET ICT CONFERENCE KUWAIT**		
	Worksmart for Events Management	+973 17002280; info@worksmartbh.com	www.worksmartbh.com
EGYPT			
6 Dec	**CYBERX EGYPT SUMMIT**		
	Ibento Global	+918 088605784; info@ibentoglobal.com	www.ibentoglobal.com
10-12 Dec	**EAI INTERNATIONAL CONFERENCE ON BIG DATA TECHNOLOGIES AND APPLICATIONS**		
	European Alliance for Innovation	conferences@eai.eu	www.eai.eu
13-14 Dec	**CONFEAS CONFERENCE**		
	FEAS	+374 44737727; secretariat@feas.org	www.feas.org
17-19 Dec	**INTERNATIONAL CONFERENCE ON COMPUTER THEORY AND APPLICATIONS**		
	Arab Academy for Science Technology and Maritime Transport	media.aast@gmail.com	www.aast.edu
18-21 Dec	**GLOBAL CONFERENCE ON ARTIFICIAL INTELLIGENCE & INTERNET OF THINGS**		
	IEEE	+1 732 562 3878; ieee-mce@ieee.org	www.ieee.org
6-7 Feb	**PPP MENA FORUM**		
	GM Events	+971 45687800; info@gmevents.ae	www.gmevents.ae
20-21 Feb	**SEAMLESS NORTH AFRICA**		
	Terrapinn	+971 44402500; enquiry.me@terrapinn.com	www.terrapinn.com
27-28 Feb	**REFUELFORUM MENA**		
	OpenRoom Events	hello@openroomevents.com	www.openroomevents.com

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EVENTS

CONFERENCES

	ORGANIZERS	CONTACT	WEBSITE
OMAN			
1-2 Dec	**INTERNATIONAL CONFERENCE ON NANO SCIENCE AND NANOTECHNOLOGY**		
	Conferencefora	+919 692200892; info@conferencefora.org	www.conferencefora.org
5-7 Dec	**GREEN HYDROGEN SUMMIT**		
	Birba Energy Services LLC	+968 99286100; info@birbaenergy.com	www.birbaenergy.com
7-8 Dec	**AIRPORTS INNOVATE**		
	ACI Europe	communique@aci-europe.org	www.aci-europe.org
16-18 Jan	**PETROLEUM SYSTEMS OF THE MIDDLE EAST CONFERENCE**		
	American Association Of Petroleum Geologists	-; -	www.aapg.org
7-8 Feb	**ANNUAL CONFERENCE OF FINANCIAL AND BANKING PERSPECTIVES**		
	Oman College of Management & Technology	+968 24051000; acfbp@ocmt.edu.om	www.acfbp.ocmt.edu.com
JORDAN			
6-8 Dec	**IEEE MIDDLE EAST & NORTH AFRICA COMMUNICATIONS CONFERENCE**		
	Al-Zaytoonah University	+962 64291511; alert@zuj.edu.jo	www.zuj.edu.jo.com
IRAN			
11-12 Dec	**INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE**		
	Researchfora	+919 078053939; info@researchfora.com	www.researchfora.com
13-15 Dec	**THE INTERNATIONAL CONFERENCE ON MILLIMETER-WAVE AND TERAHERTZ TECHNOLOGIES**		
	K. N. Toosi University of Technology	+982 188881003; international@kntu.ac.ir	www.en.kntu.ac.ir
14-15 Dec	**INTERNATIONAL CONFERENCE ON ACOUSTICS AND VIBRATION**		
	University of Tehran	+982 161111	www.ut.ac.ir
21-22 Dec	**INTERNATIONAL BIENNIAL OIL, GAS, AND PETROCHEMICAL CONFERENCE**		
	Persian Gulf University	+987 731222730	www.pgu.ac.ir
10-11 Jan	**INTERNATIONAL CONFERENCE ON MANAGEMENT AND INFORMATION TECHNOLOGY**		
	Academics World	+917 077656338; info@academicsworld.org	www.academicsworld.org
QATAR			
9 Dec	**INTERNATIONAL CONFERENCE ON BUSINESS MANAGEMENT AND SOCIAL INNOVATION**		
	Advanced Research Society for Science and Sociology	+918 895188998; info.arsss@gmail.com	www.arsss.org
5-8 Feb	**INTERNATIONAL CONFERENCE ON CIVIL INFRASTRUCTURE AND CONSTRUCTION**		
	Qatar University	+974 44033333; QUMCC@qu.edu.qa	www.qu.edu.qa
10-11 Feb	**INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE**		
	Researchfora	+919 078053939; info@researchfora.com	www.researchfora.com
15 Feb	**CYBERX SUMMIT - QATAR**		
	Ibento Global	+918 088605784; info@ibentoglobal.com	www.ibentoglobal.com
22-24 Feb	**SOLAR ENERGY SYSTEMS CONFERENCE**		
	American Institute of Chemical Engineers	-; -	www.aiche.org

EXHIBITIONS

	ORGANIZERS	CONTACT	WEBSITE
LEBANON			
1-3 Dec	**WHISKY LIVE BEIRUT** Whisky Live	-;-	www.whiskylivebeirut.com
UAE-DUBAI			
6-8 Dec	**GULF TRAFFIC** Informa Connect - Middle East	971 44072500 info-mea@informa.com	www.informa-mea.com
13-15 Dec	**MIDDLE EAST ORGANIC AND NATURAL PRODUCT EXPO DUBAI** Global Links Exhibitions	-;-	www.glexhibitions.com
17-19 Jan	**LIGHT MIDDLE EAST** Messe Frankfurt	+971 43894500	www.ae.messefrankfurt.com
24-26 Jan	**TRANS MIDDLE EAST DUBAI** Transport Events Limited	+961 3894098; middle.east@transportevents.com	www.transportevents.com
6-9 Feb	**MEDLAB MIDDLE EAST** Informa Connect - Middle East	+971 44072500; info-mea@informa.com	www.informa-mea.com
12-14 Feb	**INTERNATIONAL PROPERTY SHOW** Strategic Marketing & Exhibitions	+971 43282000; info@strategic.ae	www.strategic.ae
27 Feb	**GULF EXPO-DUBAI** International Student Network Inc	-; -	www.isnexpo.com
UAE-ABU DHABI			
6-8 Dec	**ABU DHABI DATE PALM EXHIBITION** Abu Dhabi National Exhibitions Company	service@capitalexperience.ae	www.adnec.ae
14-21 Jan	**ABU DHABI SUSTAINABILITY WEEK** Masdar	+971 26533333	www.masdar.ae
16-18 Jan	**WORLD FUTURE ENERGY SUMMIT** RX Middle East	rxinfo@reedexpo.co.uk	www.rxglobal.com
24-26 Jan	**HERITAGE MIDDLE EAST - MUSEUM & EXHIBITION TECHNOLOGIES FAIR & CONFERENCES** TG Expo Think Global	+902 163384525; info@tgexpo.com	www.tgexpo.com
19-23 Feb	**INTERNATIONAL DEFENCE EXHIBITION AND CONFERENCE** Abu Dhabi National Exhibitions Company	service@capitalexperience.ae	www.adnec.ae
SAUDI ARABIA			
5-6 Dec	**WORLD FINTECH SHOW** Trescon	+971 44549859; -	www.worldfintechshow.com
5-7 Dec	**JEDDAH INTERNATIONAL AGRICULTURE EXHIBITION** IECO Consultants	alan@visionprojects.co.uk	www.ieco.org
6-9 Feb	**LEAP** Informa Markets	informamarkets@informa.com	www.informamarkets.com
7-9 Feb	**SAUDI HORECA** Semark Group	+966 920003361; info@semark.com.sa	www.saudihoreca.com
13-15 Feb	**SAUDI ARABIA COATINGS SHOW** dmg :: events	+202 22614503; info@dmgevents.com	www.dmgevents.com
BAHRAIN			
14-16 Feb	**GDA INTERNATIONAL DOWNSTREAM CONFERENCE & EXHIBITION** Middle East Energy Events 971 442 70 739	info@e3-worldwide.com	www.e3-worldwide.com
KUWAIT			
Feb	**THE LUXURY SHOW** ATEX International Exhibitions	+971 45878627; info@atexinternational.com	www.luxuryshowkuwait.com
8-11 Feb	**KUWAIT BUILD & DESIGN WEEK** ATEX International Exhibitions	+972 45878627; info@atexinternational.com	www.atexinternational.com
EGYPT			
13-15 feb	**EGYPT PETROLEUM SHOW** dmg :: events	+202 22614503; info@dmgevents.com	www.dmgevents.com
IRAN			
30 Dec - 2 Jan	**INTERNATIONAL WATER & WASTE WATER EXHIBITION** M&T Solutions	+98 21 4291 7000; info@mandtgroup.com	www.mandtgroup.com
19-22 Jan	**IRAN TELECOM INNOVATIONS** fairtrade Messe GmbH & Co. KG	info@fairtrade-messe.de	www.fairtrade-messe.de

BUSINESS ESSENTIALS

THE BULLETIN

Nissan hosted an exclusive event in Dubai to bring owners of the iconic sports car together and celebrate the arrival of the new 2023 Nissan Z.

Huawei signed a global commitment to join the **International Telecommunication Union Partner-2Connect** digital alliance, which will bring connectivity to around 120 million people in remote areas in more than 80 countries by 2025.

St. Regis Hotels & Resorts, part of the Marriott Bonvoy portfolio of 30 hotel brands, announced the opening of **The St. Regis Marsa Arabia Island.**

Rebirth Beirut launched its new exhibition entitled "Flower Power", an art exhibition that brings together Benoît Debbané and Wissam Eid, two artists from two different generations.

du, the telecom operator from Emirates Integrated Telecommunications Company, concluded its participation at AccessAbilities Expo, which took place at the Dubai World Trade Centre.

Under the slogan "Empowering local communities", the Faculty of Engineering at the **University of Balamand** inaugurated the geographic information system awareness week organized by **ESRI** Lebanon, and announced the launch of the MENA region's first Geo-Artificial IntelligenceAcademy.

Bain & Company launched a new program titled 'Go Boldly: Bring Your Future Forward', in which an annual cohort of exceptional female leaders in the Middle East can connect, share experiences, and learn.

The **American University of Beirut** was ranked 1st in the MENA region in sustainability, and tied with Princeton University at 140th place globally in the QS World University Rankings: Sustainability 2023.

I Have Learned Academy in collaboration with the **German Foundation: KAS** organized an event to discuss Lebanese heritage at Musee Henry in Batroun.

OpenMinds launched "Together for one cause, together we run", to support those in need, joining forces with **CARE Lebanon**, **Lebanese Autism Society, Mosaik, Next Step at AUB, Step Together, Trait d'Union and Udiversity.**

Rebirth Beirut launched a new exhibition at its cultural space in Gemmayzeh, in collaboration with the three daughters of the Lebanese cartoonist and artist Stavro Jabra, who for the past 40 years reflected through his work the events in Lebanon, the Middle East and the world.

Five young researchers coming from Lebanon, Jordan, and Syria were honored during the 9th edition of the **L'Oréal-UNESCO** For Women in Science Levant Regional Young Talents Ceremony at **Ecole Supérieure des Affaires** in Beirut, held under the patronage and in the presence of Mr. Ziad Macary, Minister of Information, and attended by more than 200 guests amongst whom were politicians, diplomats, representatives of academic and scientific institutions, NGOs, and media.

In commemoration of the 7th edition of the World Week of Italian Cuisine, the **Embassy of Italy** in Beirut**,** the **Italian Trade Agency**, and **Spinneys** came together to celebrate their partnership with their annual gathering at Spinneys Signature Lebanon.

PepsiCo and **The Arab Youth Centre** announced the launch of 'Arab Youth Hackathon #Hackfor-Change' as part of their strategic partnership, signed during COP27, to grow youth empowerment initiatives in the Arab region.

As part of the 2nd edition of the EcoSwitch Festival, **Fondation Diane,** the **EcoSwitch Coalition** and **Cewas** organized a physical gathering for all eco-entrepreneurs and green start-ups at Beirut Digital District. This event was supported by the **Asfari Foundation** and **SwitchMed.**

OSN+, the region's leading streaming service for premium entertainment, introduced an entry level subscription plan for Lebanon alongside an existing premium plan, enhancing available

offerings and providing flexible options for customers.

Gulf Capital opened its new global headquarters in Abu Dhabi Global Market and obtained in-principle approval for an asset management license from **ADGM Financial Services Regulatory Authority.**

In line with its commitment to improving the health of the community in Lebanon and the region, the **American University of Beirut Medical Center** signed a memorandum of understanding with **Roads for Life** in an event held at the Issam Fares Lecture Hall, with the aim to reaffirm the continued collaboration between the two organizations and to further promote the Stop The Bleed community course.

Amazon Web Services has announced the launch and call for applications for the Clean Energy Accelerator 3.0, a high-pace, non-equity dilutive accelerator designed to facilitate partnerships with mature startups developing breakthrough clean energy technologies. The announcement was made during a session at the 2022 United Nations Climate Change Conference in Sharm el-Sheikh, Egypt.

The **Lebanese Business Leaders Association** board of directors held a meeting presided by Mr. Nicolas Boukather, in which the board unanimously agreed on the necessity to elect a new president of the Republic of Lebanon within the constitutional deadlines.

LAU Medical Center Rizk Hospital and **Saint John's Hospital** become officially and exclusively medical partners of the 20th anniversary edition of the Beirut International Marathon.

On the occasion of the International Day of the Girl, **Plan International** launched a worldwide campaign "Equal Power Now", standing with girls and calling on leaders and power holders to uphold their fundamental rights to participate in politics.

Forbes Middle East has released its fifth annual 30 Under 30 list, featuring an inspiring young cohort of entrepreneurs, pioneers, creatives, and athletes, spanning six categories: sport, commerce, science & technology, money, creative, and impact.

The United Nations Humanitarian Coordinator in Lebanon, Mr. Imran Riza, announced that the **United Nations Central Emergency Response Fund and Lebanon Humanitarian Fund** have together allocated a total of $9.5 million to prevent the spread of cholera.

Audi Lebanon introduced the all-new Audi e-tron GT quattro and RS e-tron GT. The electric Gran Turismos are the embodiment of Audi's vision for the future of mobility and serve as halo models for Audi's growing electric portfolio.

The Green Planet Dubai, a tropical rainforest home to over 3,000 plants and animals across four indoor rainforest levels, welcomed two young sloth sisters to its family of animals.

The **Korean Embassy in Lebanon** and the **United Nations Human Settlements Programme** signed an agreement for $500,000 to implement renewable energy solutions for facilities providing public services in Zahle.

UAE social enterprise **81 Designs** and Moroccan artist **Bouchra Boudoua** unveiled a new collaborative collection at Abu Dhabi Art at Manarat Al Saadiyat.

The Public Relations and Communications Association Middle East & North Africa announced that the leading creative **B2B PR agency Jargon PR** is its latest corporate member.

Emirates and **Gulf Air** signed a unilateral codeshare partnership, where the new agreement will offer easy connections and expanded choices for Gulf Air customers connecting to Dubai and onwards to a host of Emirates destinations across Europe, Africa, South America and the Far East.

In tribute to the advertising icon Dan Wieden, **Cannes Lions** has renamed the Titanium Lions the Dan Wieden Titanium Lions.

Dubai International Financial Centre, the leading global financial center in the Middle East, Africa and South Asia region, continued to attract exceptional interest from financial technology firms, making fintech the Centre's fastest growing sector.

LAST WORD

Cholera spread: a symptom of structural failures

A vaccine campaign alone will not solve the outbreak

Lebanon has been cholera-free since 1993. On October 6, 2022, that changed when the Ministry of Public Health reported two laboratory-confirmed cholera cases in the country's northern region. Since then, the numbers of cases and deaths have increased at an alarming rate. The current situation according to the Lebanese Ministry of Public Health website on November 21 shows 20 cumulative deaths and 4,008 suspected and confirmed cases, 25 percent of which are among individuals 4 years of age and below. Cholera outbreaks are also reported in other countries in the region, including Syria and Iraq. Cholera is an acute rapidly dehydrating diarrheal infection caused by the ingestion of food or water contaminated with the bacterium Vibrio cholerae. It is strongly connected to inadequate sanitation.

Lebanon's response to the outbreak so far has included launching the government's emergency appeal requesting support from the international community to procure vaccines, medicines, and water test kits. The World Health Organization (WHO) secured 600,000 doses of cholera vaccine from the International Coordination Group to vaccinate all refugees and host communities aged 1 year and above. On a local level, residents received information through various media outlets on how to wash hands and mixed messages about how much chlorine to add to their water tanks.

Unfortunately, this response has been far from addressing the root causes of the epidemic. Without addressing the underlying causes of the spread of cholera – old and dilapidated water and sanitation systems, and water privatization – behavioral interventions will have limited, if any impact in stopping the epidemic. By focusing on individual-level solutions, people and communities with limited resources are made responsible for managing and controlling the outbreak, instead of state institutions and international organizations. Overcrowding, and unsanitary living conditions in jails have long been root determinants of different types of infectious outbreaks globally since the 1800s, as have refugee camps and informal settlements.

DECADES OF DIRTY WATER

For years, researchers have been raising the alarm about the poor water quality in Lebanon, especially in refugee settlements and impoverished areas. The country lacks a national wastewater strategy, leaving it up to local municipalities with limited resources and know-how. At the same time, rivers and lakes have been dumping grounds for industries for years. In 2021, UNICEF cautioned based on a focused study that the water situation in Lebanon is on the brink of collapse. Despite the large number of studies and consultations commissioned to resolve the water pollution in rivers, lakes and water bodies in Lebanon, very little has been achieved.

In the context of an economic crisis, political deadlock, and dwindling humanitarian funding, it is not surprising that access to clean water and sanitary services has deteriorated for a considerable portion of the population. The public sector water provides about three million people with water but considering the energy crisis, a large number of the population and one million refugees rely on alternative sources like water trucks, or private sources. This has created a fertile ground for waterborne diarrheal diseases to emerge, given that a major source of contamination is microbiological. This includes cholera. Cholera epidemics are signs of structural deficiencies; historically, cholera is an outcome of failed systems and services, which is a violation of the human right to safe water and sanitary conditions.

To mitigate cholera, we do not need innovation. Instead, we need to learn from history – that the sanitation movement was critical to improving public health – and to go back to basics. No human being, whether citizen or refugee, should be deprived of the right to clean water and a healthy environment. Promoting individual hygiene behavior change – the only public health action undertaken by the state at this point while it waited for adequate number of vaccines to arrive – will only narrowly contribute to limiting the spread of transmission. Unless the government and high-level decision-makers actively work towards urgent waste water management, upgrading the public water supplies in Lebanon, the cholera outbreak will not be contained.

However, there is nothing so far in the government discourse which is showing any commitment to work on the systemic failings. We call on the government, municipalities, and United Nations' agencies to direct urgent resources to water treatment plants and utilize the expertise already available in academic institutions to provide environmentally sound solutions, and prevent future outbreaks of other types of waterborne diseases. Improved water supply interventions alongside a focused cholera vaccination program are proven to be more likely to yield favorable public health outcomes than just a vaccination program alone.

Co-written by the Department of Health Promotion and Community Health, at the Faculty of Health Sciences at the American University of Beirut

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