

DISENTANGLING DYSFUNCTIONS IN THE SUPPLY CHAIN: IMPORT OF AGRICULTURE NUTRIENTS TO LEBANON

Pierre EL HADDAD

Université Saint Joseph de Beyrouth
(Lebanon)

Ghadi EL KHOURY

MLS SEPT
Project Coordinator Naccache
(Lebanon)

ABSTRACT:

This study was undertaken following an expression of interest from a Brazilian company producing specialized fertilizers. The company's objective was to elaborate a development strategy in Lebanon given the potential for expansion in neighboring markets. Inspired by the socio-economic intervention research, the study was undertaken following an operational methodology that sought the different dysfunctions of the fertilizers' supply chain in Lebanon. The intervention produced a thorough and actionable description of the agricultural nutrients market and prescriptive elements to elaborate the strategy as commissioned by the company. The paper also demonstrated the flexibility and robustness of applying principles of socio-economic interventions to deliver effective consulting results.

Keywords: Management Consulting, Agricultural Nutrients, Intervention Research.

MOTIVATION AND PROBLEMATIC

Lebanon is considered as an important agricultural market because of its biodiversity. Though territorially small, the country is gifted with a varied topography and multiple microclimates. Agricultural land accounts for 63% of the habitable territory. It also witnessed an increased local production in the last decade. For example, plant production went from 926 million USD in 2010 to 1.2 billion USD in 2014. Additionally, the rich export history that Lebanon had during the XXth century helped Lebanese agricultural companies develop market shares in the Middle East and Africa.

The main cultivations are cereals, forage crops, peanuts, and vegetables like potatoes, legumes, onions, garlic. The quantities are larger than fruit produce, but not in value. Fruit production focuses on citrus, apples, pears, grapes, almonds, bananas, apricots, cherries, and a very promising vineyard sector particularly for exports.¹

¹ 037- CREAL - page 37-38

The Lebanese agricultural sector has almost universally adopted the use of micronutrients driven by considerations of efficiency. The noticeable reduction in the price of irrigation equipment and technologies also helped the increase in adopting micronutrients. Fertilizers are generally imported with emphasis on the commodities rather than specialized products. Local production of fertilizers is focused on raw products destined for export.

This study was undertaken following an expression of interest from a Brazilian company producing specialized fertilizers. The company aimed at elaborating a development strategy in Lebanon given the potential for expansion in neighboring markets.

Additionally, recent economic and security crises in Lebanon brought the topic of food security to the forefront, particularly with the scarcity of foreign currency reserves needed for imports. The debate also brought up the importance of local agriculture in reducing youth unemployment, increasing local production, and reducing the trade deficit.

This study is guided by an intervention research methodology that sources its interest in building actionable knowledge of scientific value addressing a specific need. It aims at informing a development strategy to import specialty agricultural nutrients to the Lebanese market by evaluating the dysfunctions in the supply chain. One important consideration is that the research was commissioned by a remote supplier who was conceivably discreet about their business model, strengths, and weaknesses; In parallel, to having an interest in a niche segment of the Lebanese market, which is dominated by discreet market players, and segmented, by various challenges such as limited access to information, and a proven, yet challenging market

METHODOLOGY

The study adopted a methodology inspired by the socio-economic intervention research (Savall & Zardet, 2011). Inductive in nature, the socio-economic intervention research has three epistemological and operational principles that assure its scientificity and the actionability of its results. The principles are (a) cognitive interactivity, or the animated dialogue between researcher and actors to co-construct knowledge; (b) contradictory intersubjectivity, to build consensus among multiple views, and (c) generic contingency, stipulating that contingencies do not deny the existence of generic invariants in human organizations (Coghlan & Brydon-Miller, 2014; El Haddad et al., 2015). The socio-economic approach was developed over 40 years with more than 2000 case interventions, therefore providing a robust methodological basis (Savall & Zardet, 2011).

The research was designed to serve the purpose of the study, that of diagnosing dysfunctions in the supply chain and the major barriers to entry to the Lebanese market. The dysfunctions were classified along 6 families of dysfunctions: work conditions, work organization, 3Cs (communication-coordination-cooperation),

time management, integrated training, and strategic implementation (Savall & Zardet, 2011).

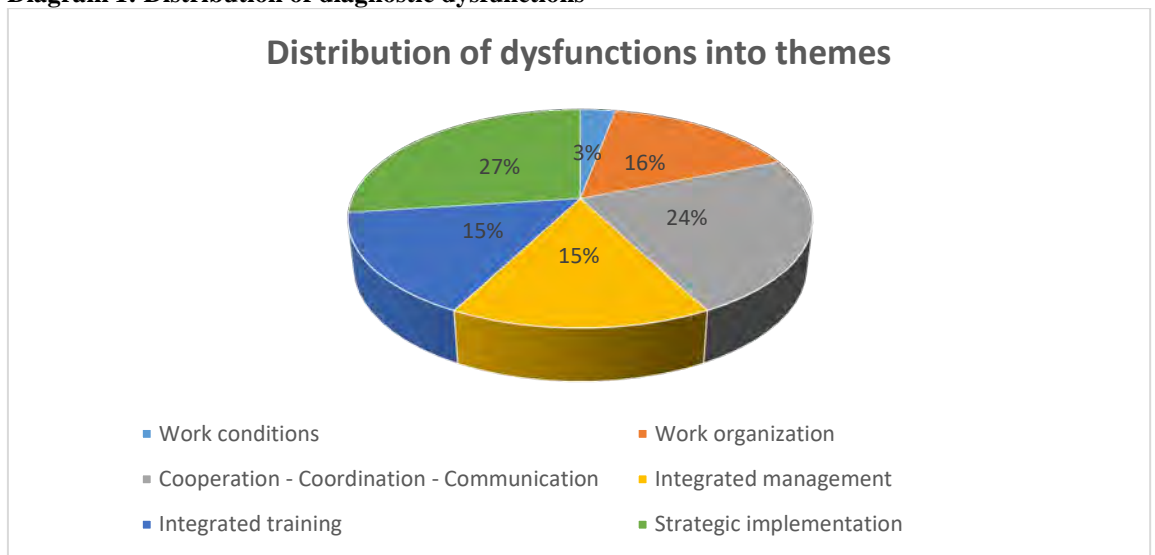
The study was undertaken following an operational methodology that first sought the different dysfunctions manifest in the import and distribution of fertilizers across various levels ranging from administrative challenges, to market considerations.

Twenty importers were contacted, including the largest in Lebanon and the most experienced. Reception was mitigated. Some expressed immediate interest and scheduled meetings, while others were reluctant to meet. Some did not respond to our solicitations.

- 20 companies out of 70 solicited
- 10 of them being the top players that cover more that 70% of the market
- 10 individual interviews were conducted
- 4 of which, are top players making up around 40% of the actors
- Smaller importers were contacted to corroborate the information of big importers
- 2 follow-up interviews were conducted, one with a large company, and one with a medium sized company
- 2 interviews with public servants representing the concerned government agencies; the ministry of agriculture's fertilizer bureau, and the Lebanese Agricultural Research Institute. LARI houses the government's laboratory that analyzes agricultural import.

A total of 14 interviews were conducted with representative actors spanning the private and public sectors. Private sector interviewees are actors in companies that cover around 40% of the market size. Public sector interviewees represent directly concerned public agencies. The diagnosis revealed a total of 137 dysfunctions, grouped under 24 key ideas (Diagram 1)

Diagram 1: Distribution of diagnostic dysfunctions



The intersubjective exercise in socio-economic interventions is straight forward. Information collected from the field is organized under rubrics and debated among the actors in a “mirror effect” meeting. However, it was impossible in this research to gather all actors in one meeting to deliberate together. Therefore, the intersubjectivity exercise was built up gradually. Each interview comprised two parts. The first part was the customary exercise of semi-structured interview. The interviewees would express their perceptions of the dysfunctions in the supply chain of agricultural nutrients. The second part comprised the intersubjective exercise, where an aggregation of the previous interviews was presented and discussed with the interviewee. When disagreement occurred, it was noted and brought back to other interviewees in a back and forth movement. Convergences and specificities were noted. This deconstruction and reconstruction served to synthesize a meta-script from alternative viewpoints within the industry (David Boje and Grace Ann Rosile, 2002). Table 1 summarizes the convergences and specificities in the perceptions of public and private sector actors.

**Table 1: Convergence and specificities table.
Comparative perception of Public and private sectors actors.**

Pivotal ideas				
Key idea	Logistical and technical		Market situation	
	Public actors	Private actors	Public actors	Private actors
Test trials & standards are a burden	Test trials are a necessity yet they can slow down the import of new technologies <ul style="list-style-type: none"> - Explosives risk - Product quality and impact on different production levels 	Efficiency is paramount and unnecessary waiting time & expenses are not welcome	Large number of processing samples cued in LARI test laboratory due to underfunding	Product is price sensitive
				Testing at the only authorized private laboratory is expensive
				Actors are unwilling to carry stock
Import authorization from the LAF – Lebanese Army	The safety risk with ammonium nitrate based fertilizers does not allow for any shortcut	Technical control is slow; an average of 7 days is required	“no-shortcut” administrative policy by the LAF, meaning testing & release is rendered at the army’s pace	Delays add demurrage costs, increasing overheads on importers and subsequently end-users

				Credit burden is a risk handled by importers
Absence of inter-organizational and inter-administrative coordination	Government and other international organizations are unable to organize and support farmers' in agricultural production	Banks have been replaced in allocating credit to farmers by importers and local sellers	Public administrations and authorities are not involved in monitoring the market situation beyond legal requirements	Unclear common agricultural strategy, the free market offers a diverse range of products; cheap, inexpensive and premium
Sales strategies are limited and weak	Absence of Government strategy for the agricultural sector		Public administrations have not standardized pricing and only do quality and specification controls	Trust factor is important for importers, this extends to resellers
Market situation	Absence of government strategy and accommodations to facilitate the export of local produce	Traditional regional markets are affected by economic and security situations, rendering them inactive or unattractive	Government is limited to its due diligence in controlling the import of fertilizers	Market is saturated with contrasted products, catering to different levels of quality, mostly on the lower end in terms of quality

Field data was appended with document analysis, mainly studies undertaken by both private and public sector entities; McKenzie study for the Lebanese Government (2018), IDAL Agricultural study (2017), Centre de Recherche Agricole du Levant- CREAL (2015) A cross examination ensued between secondary and field data.

The follow-up step was a second mirror effect analysis with both the Brazilian company and the Lebanese companies that demonstrated the most interest in this research. Practically, the main takeaways were brought up during two online

meetings with the supplier. Their insights and questions were brought up back to the Lebanese actors for a thorough examination.

Lay of the Land: Fragmented and credit ridden.

The analysis of field statements revealed the dysfunctions that affected the supply chain in the import and distribution of fertilizers. The main findings were grouped under three key ideas: financial, logistics, and the market's situation. The findings are narrated hereunder and supported with field note quotes for conclusion validity (Miles & Huberman, 1994).

FINANCING

On the financial side, the industry is fragmented, and orders are small except for few large clients such as industrial farmers. Products are either high quality or low-end varieties, with most of the imports from the latter. In general, importers share the costs by joining their orders in one container shipments.

The product is price sensitive. The most expensive products are sold at around 26.6\$ per liter with a profit margin of 17-25%. The price was corroborated by several actors. However, the credit structure of the market suggests higher margins. Importers extend long credit lines to their clients reaching more than one year. The applicable commercial interest rates in the banking sector suggest higher profit margins.

Additionally, farmers are facing increasing difficulties securing loans from banks. This is due to the weakness in their equity structure and the high cost of rental of agricultural land. Therefore, importers find themselves bound to provide farmers with long term credit lines to prevent the farming industry from collapsing. This is critical when considering the risk faced by these actors over the absence of not only banks, but also government subsidies and emergency funds, in ensuring market stability and sustainability.

Attempts by the ministry of agriculture to unify prices were met with resistance. They failed to be enforced because they would reduce the margins of import companies who are replacing banks in carrying the credit risk of farmers. Public financial records of import companies were not available, and the discretion of interviewees about this specific issue remained a hurdle to ascertain the profit margin.

LOGISTICS

Red tape burdens the import and export process, adding considerable risks and delays and subsequently costs to the supply mechanism. Additionally, the risk of trade bans and regional instability are also components that induce higher margins. The closure of Syrian borders and inability to ship from Europe through or to Syria is also a factor that adds to the cost, and importantly, reduces the ability to be present on Middle Eastern markets.

Fertilizers are sensitive sanitary products and a security issue because certain products could be turned into explosives (The Beirut blast on August 4, 2020 is a demeaning example). As such, a dual inspection and testing at port of arrival is required before the release of goods. Sanitary and technical testing is conducted by the ministry of agriculture approved laboratories only. Those are limited to American University of Beirut's (AUB) or the ministry's own LARI laboratory which is understaffed and under-funded. Therefore, the process of sampling, testing, and returning the results is a days-long, and sometimes weeks-long process. In parallel, security permissions are granted by the Lebanese Army through the Ministry of defense which according to respondents, takes up to 7 days to process. This leads to increased demurrage fees at the port.

MARKET CONSIDERATIONS

The market is replete with substitute products particularly that the market accommodates low quality products. Imported nutrients “do not systematically comply with the technical specifications recommended by government agencies. This is critical especially because the ministry of agriculture’s strategy is not communicated”. Government strategy in agriculture. Additionally, banned products are still imported through unconventional routes as contraband. Interviewees attributed this phenomena through two very distinct rationales with one common denominator; in some instances, the absence of substitute specialty fertilizer that was banned without alternatives. Or, due to the increasing price of products, and weakening profit margins made by farmers on their sales (exacerbated by the absence of a farmer specific credit structure), that push them towards cheaper products. The common denominator here being the absence of a clear and unified.

The relation between importers and farmers is not always direct. Local merchants are part of the supply chain; importers that represent multinational companies have a policy to diversify the channels of distribution, and therefore, they supply competing merchants.

There is a perfusing lack of trust between local sellers and the importers due to non-exclusivity and price volatility, which percusses on farmers, who have to solely assume the increasing credit risk. This is exacerbated by the absent agricultural strategy, the weak export market and the uncertainties surrounding crop success in unpredictable weather patterns, as was corroborated by different stakeholders.

The absence of official safety nets has rendered an alternative market dynamic that is relationship based, often solidified by gentlemen’s’ agreements between established importers and their sellers, all the way to the seller and farmer.

Summary of descriptive findings

In sum, there is consensus between private sector stakeholders and public administrations about the de-synchronization in the sample analysis process between the ministry of agriculture’s check or requirement, and the Lebanese Armed Force’s independent analysis; causing a delay that increases demurrage fees supported by the importer.

Moreover, the absence of a clear and communicated national agricultural strategy or policy contributes to informal and often relationship-based sales strategies,

particularly as the market is almost exclusively national, given the absence of trade routes agreements between neighboring countries and partners.

The weak administrative support therefore has weakened the fertilizer and agricultural market to a limited number of players, who retain the upper hand vis-à-vis their clients, given the lack of oversight and increased bureaucratic red tape, where private entities have filled the vacuum of power and are rendering their own market strategies.

Prescriptive findings: Recommendations from the field

The diagnostic findings in the previous paragraph provided the lay of ground of the dysfunctions in the supply chain of agricultural nutrients in Lebanon. They informed the recommendations necessary to elaborate a market strategy for a new coming supplier. However, the elaboration of the recommendations was developed along an active deliberation with the intended supplier. Practical knowledge was structured through the concurrence of the suppliers' expertise and the researcher's field analysis, document analysis, and the use of relevant management tools.

The dual-pronged approach was necessary given the inherent geographical challenge, particularly for a market penetration strategy that centered its area of attention on one of the Middle East's most interesting markets, given the diverse topography and strong produce export potential; therefore identifying the prominent stakeholders, market situation, import and distribution processes is paramount given the increased risk associated with an pan-continental strategy development, in a market that is considered to be reserved and challenging to access given the administrative and commercial structures present.

The absence of public sector initiatives, incubator and facilities, coupled with the absence of tangible private-sector initiatives had rendered the market inaccessible to most given the lack of incentives present, in parallel to the absence of public information about imports, sales and production values.

TOOLS UTILIZED DURING MARKET RESEARCH AND ASSESSMENT

From here on, and given the endeavor at hand, strategic management tools were engaged, utilizing SEAM's six families of dysfunctions, a methodology coined by ISEOR, with a mirror effect being conducted with every interviewee in order to retrace and confirm dysfunctions and field note quotes that were attributed. Following which, a second concentration with pertinent actors and stakeholders was undertaken to cross examine and challenge the findings at hand.

The six families of dysfunction developed by ISEOR are as follow: work conditions; work organization; 3C's: communication, coordination, cooperation; time management; integrated training and strategic implementation. A methodology that proved to be adequate in conducting interviews allowing for the interviewee to freely express himself while guiding him through the main families of dysfunctions and allowing him to communicate the dysfunctions as well as strong points and market situation freely.

What follows after each interview is a mirror-effect with every interviewee, in order to ascertain and cross examine the main take ways and statements made.

A second concentration with actors following the primary evaluation of the market was therefore necessary to cross examine overlaps with the supplier's knowledge, his expectations and his input on an elaborated strategy. An emphasis on business models was put, especially in the face of big competitors already established on the market, additionally, marketing considerations given adoption rates for nutritional fertilizers and shelf space of products.

What then followed was a further evaluation of the preliminary findings with actors, which included large agricultural operations and importers in order to cross examine and evaluate their input on the established findings which proved to be within the general consensus. Although the experience varied from one another, the commonalities that were mentioned in the main findings, and the prescriptive input proved to also be similar and universal among these stakeholders given the universality of these dysfunctions.

Interviews were conducted with resellers in order to gather various inputs and cross-examine findings, particularly given their relationship as middlemen to both end-user and importers. The main findings matched their market situation, with slight variations depending on every reseller's business model as well as his personal relationship with the end-user and importers, allowing for different accommodations and facilities based on their socioeconomic situation.

The main findings were then grouped under main convergences and specificities which accounted for issues in the import process, threatening profit margins due to sensitive logistics on account of import regulations set by the Lebanese Army; which leads to lower-quality imports, as stated by some actors, as well as fragmented imports, with instances of shared imports between importers as a cost-sharing measure;

Given the sensitive pricing of such products, importers have replaced banks in assuming the credit risk of farmers. A large part of the logistical concern is due to delays for inspection at docks, a challenge that has yet to be overcome given the closure of transit routes from Europe through Syria, as such inventories are generally of lower-quality and can't answer accidental peaks given the limited stock that's allocated.

CONTRADICTIONS BETWEEN PRIMARY AND SECONDARY DATA

Additionally, the mirror effect included a document analysis, mainly studies undertaken by both private and public sector, including the 2018 McKinsey consultation for the Lebanese Government, the 2017 IDAL (Investment Development Authority of Lebanon) market study, and the 2014 market study by CAL, Comptoir Agricole du Levant, for cross examination through different stakeholders for evaluation and analysis of findings and comments.

The main takeaway from the document analysis was certain discrepancies vis-à-vis figures that were included in the available documents, particularly between the IDAL market study and the McKinsey consulting report which in the opinion of interviewees failed to meet the market realities and bureaucratic red tape related to the studies.

Additionally, the absence of available data from both LARI and ministry of agriculture made the available pool of data quite scarce, particularly in terms of recent and credible studies following the nutritional and economic developments in the last decade.

STRATEGY ELABORATION & RECOMMENDATIONS

An elaborated strategy was therefore necessary, particularly for a brand competing against well-established brands, which meant that the market penetration had to be conventional through a veteran importer who has a thoroughly established operation, that expanded beyond the Lebanese border, or, through a younger importer with a more dynamic approach, that is able to adapt and overcome in the face of ever-changing market trends.

The recommendations issued were therefore twofold, and offered various propositions, given the inherent risks in such a limited market. The first recommendation focused on a “conventional” approach, through an established market player, with a regional network and area of operation that could allow for more predictable engagements, particularly when accounting for interests in expansion beyond the target market. While the second recommendation brought forth a newer market player, that had proven his market position, whose dynamic engagement and rapid expansion into neighboring markets would have brought forth a more interesting proposition in newly acquired and fertile markets.

The gist of the strategy aimed at mitigating the risks brought forth by the field evidence, gathered and synthesized through the study’s multi-level approach; thereby insight from both public and private entities was substantial enough to warrant understanding the logistical considerations at hand to narrow down the pool of choice to candidates with both the know-how and the room for growth with the additional produce, should they express an interest.

The bureaucratic red tape that was brought forth is an eventual risk, particularly for newer or less experienced importers with little know-how in handling logistical delays caused by sample testing and processing times which would increase demurrage fees and overall cost on such a price sensitive product.

This comes on par with importers that fit these criteria, and have flexible business models that have adapted to the trade and economic crisis on one end: having found sustenance in their local operations and have accommodated their clients and the market through various practices, including credit assistance. And on the other hand, importers that have a wide range of clients, and are comfortable with handling a diverse portfolio of products, thereby covering potential gaps in the national market, and their own clients.

CONCLUSION

In conclusion, it was made apparent that the lack of agricultural policy and strategy set by the Government, and the layers of bureaucratic red tape have been covered through an informal means of practice meant to provide a basic lifeline for farmers that allows importers and stakeholders to maintain their operations. This manifests itself in the added costs on imports, and the processing times taken, which in turn affect the final price of products, in addition to further limiting the market to established stakeholders. This is on par with the weak export market, which therefore creates a certain status quo among different areas and stakeholders, having replaced Government agencies and agricultural banks in assuming the credit risk and national nutrition strategy.

In practice, this finds its interest in the dissociation between the Government's expectations, alongside its publicly available policies through its partners, and the market realities that are faced by different stakeholders, where the misalignment is most certainly evident in the challenges and objectives involved in the agricultural supply chain and its impact on the national economy, the GDP, and the Agricultural GDP, or AGDP.

This is pivotal, given the 63% habitable territory of Lebanon being fit for agriculture, in a country famed for its widely available water, suggests that if a proper strategy is set and honored, the AGDP, ergo the GDP, would be positively influenced by increased fertilizer consumption, seed distribution, and credit assistance to farmers (Chandilo & Hussain, 2019)

The interest that this action research puts forth relate to the realities of foreign direct investments in Lebanon, the methodological approach and exploitation of SEAM tools and publically available documents render a unique approach into assessing and elaborating broad, yet tailored, market strategies, that is transparent and comprehensive; fit for an array of industries looking to expand into the Lebanese territory.

REFERENCES

- Coghlan, D., & Brydon-Miller, M. (2014). *The SAGE encyclopedia of action research*. Sage
- Chandilo, A., Hussain, I. (2019). *Fertilizer consumption, water availability and credit distribution: Major factors affecting agricultural productivity in Pakistan*. Journal of the Saudi Society of Agricultural Sciences.
- CREAL – Centre de Recherches et d'Etudes Agricole Libanais (2015). *Lebanese Agricultural production (2010-2014)*.
- David Boje & Grace Ann Rosile, (2002). *The theatrics of SEAM*. Journal of Organizational Change Management.
- El Haddad, P, Bonnet, M and Tabchoury, P (2017) The socioeconomic approach to management: Methodological positioning. Paper presented at the 2017 AOM Conference.

IDAL – Investment Development Authority of Lebanon (2017). *Agriculture Sector, 2017 factsheet*.

Miles, M., Huberman, A. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, Beverly Hills, California: Sage Publications.

McKinsey (2018). *Lebanon Economic Vision*, Full report.

Savall, H., & Zardet, V. (2011). *The qualimetrics approach: Observing the complex object*. IAP.

Table 2: Diagnostic table.
Comparative count of dysfunction quotes

Convergences

302	Relationship to neighboring services	5
307	3C frameworks	5
308	Transmission of information	7
310	Horizontal 3C	8
402	Planning, scheduling of activities	6
404	Factors disturbing time management	10
503	Available competency	5
601	Strategic orientation	19
602	Authors of the strategy	10

Table 2: Diagnostic table (Continued).
Comparative count of dysfunction quotes

Specificities:

102	Equipment and supplies	2
105	Physical workload	1
106	Work hours	1
203	Interest of the work	1
205	Workload	2
207	Organization chart	3
301	3C internal to the service	3
305	3C at the board of directors level	1
306	3C between elected authorities and public servants	1
309	Vertical 3C	2
401	Respecting deadlines	4
403	Poorly-assumed tasks	1

501	Adequacy of training-Job	4
502	Training needs	4
504	Training frameworks	4
505	Training and technical change	4

603	Breaking down and organizing strategic implementation	2
604	Tools of strategic implementation	1
605	Informations systems	2
606	Means of strategic implementation	2
607	Personnel management	1