

أبعد من الإسمنت BEYOND CEMENT

نحو رؤية تنموية بديلة
لشكا وبلدات الطوق

TOWARDS AN ALTERNATIVE VISION
FOR CHEKKA AND SURROUNDING TOWNS

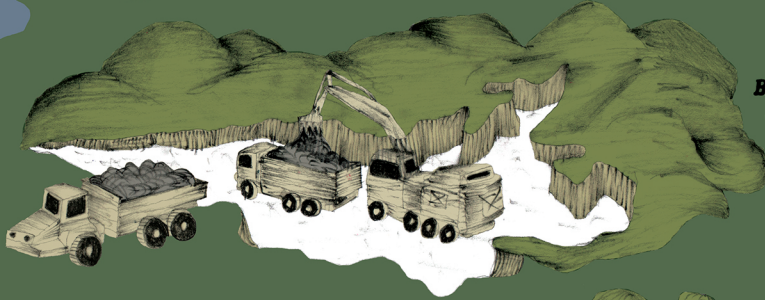
المسابقة من تنظيم «استوديو أشغال عامة»
بالتعاون مع نقابة المهندسين في بيروت وطرابلس
وتحت رعاية إتحاد بلديات الكورة

THE COMPETITION IS ORGANIZED BY PUBLIC WORKS STUDIO
IN COLLABORATION WITH
THE ORDER OF ENGINEERS IN BEIRUT AND TRIPOLI
& UNDER THE PATRONAGE OF KOURA MUNICIPALITIES UNION

Chekka – Heri Seafront
شالوع الهري – شكا



Badbhoun Quarry
مقلع بدبهون



*Koura's Agricultural
Middle Plain*
سهل الكورة الأوسط



التسجيل في المسابقة بين 17 أيلول و10 تشرين الأول 2019

REGISTRATION FOR THE COMPETITION IS OPEN BETWEEN SEPTEMBER 16 AND OCTOBER 15 2019

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1. Introduction

1.1 Overview

The towns of Chekka and Koura today, particularly what is known as the Collar Towns¹, have become a striking example of the lethal outcome of public policies and poor planning in Lebanon.

The residents of the area remember it as “Green Koura”, as it’s surrounded to the North by the Qadisha Valley and to the South by Nahr al-Jaouz river, which separates its natural coast from the Caza of Batroun, and the al-Asfour and al-Jarada rivers, which are adjacent to green highlands and groves of olives, grapes, figs and the like. The towns of Koura lie atop groundwater originating in Tannourine and which is considered one of the richest water reservoirs in Lebanon. These towns extend all the way to the seashore, where fishing, salt extraction and other maritime activities thrived. These environmental features led to the development of site-specific economic activities, long before Koura’s coast and hinterlands were transformed into an industrial zone haphazardly and erratically littered with factories, companies and quarries.

In 1931, the first cement factory in Lebanon – the Lebanese Cement Company – was built on the coast of the towns of Chekka and el-Heri. Roughly two decades after it began its operations, another cement factory, owned by the Cimenterie Nationale, was built on the coast of Chekka. At the time, there was no such thing as the Ministry of Planning, the Urban Planning Law, or any regulations for land use in Chekka or its surrounding towns, let alone on the national level.

The operations of the cement companies expanded without any form of control, ignoring health and environmental standards, through a number of practices that were authorized by the Lebanese government.² All this happened under national policies that greatly contributed to their success and development: in 1993, the Lebanese government banned foreign cement imports, which led to the repeated increase of the price of the ton, under continuous political cover and support. The opening of the cement factories in Chekka coincided with the beginning of operations to extract raw materials from neighboring towns. Unlicensed quarries spread in Koura towns, which led to a rapid deterioration of the environment, and people’s health and livelihoods. Land purchases were a primary factor in the spread of companies and their control over the fate and

¹ These include Anfeh, Chekka, el-Heri, Kefraya, Badbhoun, Kfarhazir, Amioun, Bechmezzine, Fih, and Btorram

² Such as acquiring a license to transport the cement in 1956 (contrary to the provisions of the 1938 decree), occupying public maritime domains (contrary to the 1925 law for public domains), establishing a customs office and independent export ports (1967), exploiting the al-Jaouz River and the al-Jaradi spring in ways that deprived residents of using them.

resources of the area, as they benefited from the economic deprivation and marginalization of the small towns.

The least that can be said about the transformation of the area is that it was overarching and destructive socially, economically and environmentally. Industries failed to become a sustainable alternative to agriculture and maritime activities as primary sources of income. Consequently, and with time, the options available to the area and its residents became very limited, especially in towns surrounding the factories. This pushed residents to call them “Collar Towns” – a term used in arabic (baldat al tawq) when a place is besieged by a hostile entity, and separated from its surroundings from every side.³

To counter these transformations and the damage they caused, civil groups and environmental organizations have been leading a prominent movement since the 1990s in Chekka and Koura. During those years, many organizations raised the issue of the pollution caused by factories. Some even published studies underlining the direct environmental harm caused by the emissions of the cement companies and their quarries, including air, ground water, sea water and soil pollution, which also affects people’s health and the flora. Recently, actions intensified and grew to include petitions, sit-ins, filing complaints and lawsuits, seminars and protests. The movement included different social groups, in addition to some municipal councils and the Union of Koura Municipalities, which took up the fight to shut down the illegal quarries owned by the companies.

In this context, and in support of the efforts of the residents and the ongoing movement, Public Works Studio, in collaboration with the Order of Engineers & Architects in Beirut, and Tripoli, and under the auspices of the Union of Koura Municipalities, is pleased to launch an open competition for inclusive alternative solutions that simultaneously address the environment, the local economy and urbanization in Chekka and the Collar Towns. This competition is open to professionals and academic institutions specializing in urban, environmental and agricultural planning, in addition to those with experience in design, social sciences, economics, and public policies. This call invites these professionals to collaborate and put their diverse experiences and backgrounds together to develop proposals and visions that take into account the principles of local development, environmental issues, and residents’ concerns in Chekka, el-Heri, Kefraya, Badbhoun, Kfarhazir, Amioun, Bechmezzine, Fih, and Btorram. We hope that these proposals become a starting point for discussions that can form broad coalitions to advocate for an inclusive and livable environment, and a development vision governed by the principles of social justice, instead of limited economic interests.

³ Politically speaking, the term Collar Countries is used to refer to the countries surrounding Israel (Egypt, Syria, Lebanon, Jordan and Palestine).

1.2 Chekka and the Collar Towns: Understanding the Challenges

In Lebanon, our national vision for economic development has long been closely linked to the construction sector. The focus on land as a source of profit and wealth accumulation has destroyed livelihoods and the relationship between people and their surrounding environment. This trend is manifested in the land-use plans, which are devised without involving residents and affected populations. On the one hand, this type of planning remains a tool for the powerful, ignoring urgent matters and excluding large social groups.

In Chekka and the Collar Towns, this has led to a number of major issues that need to be addressed. So what are the challenges facing this region?

1) The Dominance of One Economic Sector

In Koura, economic activities no longer bear any relation to the area's environmental features. Instead, many long-standing economic sectors (especially agriculture, fishing, and internal tourism) have been endangered. So were the lives and health of people, all in the name of the development and job opportunities believed to be brought on by the cement industry. Additionally, with the deterioration of the agriculture and fishing sectors on the national scale, the area became impoverished, with high rates of unemployment. Today, its economy mostly relies on expatriates, who immigrated in three waves: first, in the 1920s to Brazil and Argentina; second, during the civil war; and third, in the 1990s to the Gulf in search of job opportunities.

2) Partial Urban Planning

Thinking about development in Lebanon is always done on a narrow and incomplete geographical and administrative scale that hardly ever takes into account components from outside the town, area or caza. The result is that it becomes inevitable for contradictory activities to take place within the same geographic area. In Chekka and many Koura towns, land use classifications are "patched" together, even though they are not necessarily coherent or compatible. Parts of these towns are classified as "industrial zones" in an erratic way (as if it were a *fait accompli*) without enough buffer or transition areas separating them from residential or green areas. While the 2009 "National Physical Master Plan of the Lebanese Territory" was an opportunity to devise public policies on the national level, the systematic and overarching violations of the principles of this decree by public administrations resulted in contradictions and repercussions that directly affect people's lives.

3) Non-enforcement of the Law

In Koura, the laws are, by and large, not applied. Several political powers and public administrations are complicit in this situation. The quarries and crushers there operate illegally, and do not have any official permits. They are also located on sites that conflict with both the "National Master Plan for Quarries and Stone Crushing Sites" (2002) and

with the recommendations of the “National Physical Master Plan of the Lebanese Territory” (2009). In fact, between 1996 and 2005 the number of quarries in Lebanon rose from 711 to 1278, the majority of which are concentrated in scrubland, grassland, and urban areas, in contradiction with existing legal frameworks.

4) Cement Companies’ Control over Socio-Political Entities

In the past, cement companies were able to play an economic role in the area by providing jobs to residents, and conducting large land purchasing operations, which contributed to the local community overlooking the damages they caused. But over the past twenty years, and with the mechanization of operations, which reduced hiring drives in the companies, they turned to directly funding a number of municipalities, as well as local projects and establishments. However, this led to the emergence of popular anger that led to the boycott of clubs and institutions and activities supported by companies, which led to the rejection of any contribution or funding from these companies. What complicates matters further is the local administrative situation: most municipalities negatively affected by cement companies are within the Caza of Koura, while the towns of Chekka and el-Heri, where the companies are headquartered, lie within the Caza of Batroun.

5) Deterioration of the Environmental and Health Conditions

The emissions of the cement companies and their quarries have directly harmed the environment, by polluting the air, groundwater, sea water and soil. On the one hand, these companies’ plants run on petcoke, which produces toxic gas emissions that contaminate the air and come into contact with humidity. When it rains, this substance mixes with the soil, rendering it acidic, and thus not suitable for agriculture. In addition, the dust emitted by companies and quarries, as well as the emissions of furnace stoves, increase the risk of cancer, which is the highest in Lebanon - raising questions about the operation and effectiveness of filters, fuel and raw materials used in furnaces. The two companies also use thousands of cubic meters of ground and river water daily, which is an extremely high rate. When it comes to sea pollution, petcoke is stored directly on the seashore. During storms, the high tide carries this substance away, while its small crystals roll into the water when the sea wind blows. In addition, the company’s liquid waste that leaks directly into the sea contributes to the destruction of the maritime environment and fishing.

1.3 The Competition: Open Call for Alternative Visions

All the aforementioned challenges underline the urgency of reconsidering dominant approaches to development, land use, and the institutional framework that governs them, in addition to the political context, which requires a novel and creative counter-approach. As such, this competition is an open call for planners, designers, environmental scientists, agriculturists, economists and other professionals to draft an intervention framework, which simultaneously answers the concept of sustainable

development and the immediate needs of the people, including job opportunities and a local economy, without compromising their health, the environment and local economic resources. This competition proposes to address three strategic sites, which we found were open to complementary interventions within a wider developmental vision. These cases call upon us all, professionals and concerned citizens interested in the intersections between sustainable environment and social justice, to address the following questions:

1) Koura's Middle Plain: The agricultural plain was subjected to excavation for clay extraction by the cement companies between 1967 and 1984. The pits have not been rehabilitated since, and continue to damage the soil and olive groves today. How can we rehabilitate the agricultural middle plain and the neglected clay extraction pits and redefine this site's role in the area, its productivity, and its (economic) relevance to current and upcoming generations of Koura residents?

2) The Chekka and el-Heri Seashore: The coast and seafront of Chekka and el-Heri have been negatively affected by pollution, expanding industries and continuous encroachments. How can we build on the seafront's competitive advantages to provide a sustainable economic and development alternative to the current industrial model (and particularly cement) and those dependent on it, while limiting its negative environmental impacts?

3) The Quarry along Chekka, Badbhoun and Kfarhazir: Two illegal quarries have expanded in the area with total disregard to environmental, health, and landscape considerations. By taking the quarry related to the al-Sabeh factory as a pilot, what intervention scenarios can reduce its spread/impact and propose tracks for its rehabilitation on the basis of social equity, environmental justice and economic sustainability?

Participants must address one of these sites and suggest alternative visions that present innovative, inclusive, and environmentally-sustainable solutions that operate across three levels:

- Set a strategic vision for the region as a whole governed by the principles of sustainable development, social justice, instead of limited economic interests.
- Develop a design, project or concept for one of the sites to limit the damages sustained and enhance its potential.
- Devise a media based campaign for the proposal which can become an advocacy tool with the potential to effect change on the short run.

Competition Guidelines

- Taking as a starting point the principles of Sustainable development as defined in the United Nations Global Goals SDGs

- Adopting comprehensiveness and sustainability in the visions, taking into account the National Physical Master Plan of the Lebanese Territory.
- Preserving local environmental components and landscapes.
- Finding economic solutions that afford development opportunities to multiple segments of residents, where the interests of all parties and social groups are accounted for.
- Addressing the damage caused, reinvigorating the surroundings, and enshrining the right to decent living in the area, taking into account the moral, health, and social impacts sustained by various segments of the people due to industrial operations.
- Fostering the local and cultural heritage of the region.
- Promoting existing landforms and natural landmarks.
- Developing context-sensitive approaches and enhancing the connection between the site and its surrounding context, taking into account the human aspect.

Goals of the Competition

- Making the proposals a starting point for a public discussion around development and our understanding of it, taking Chekka and Koura as an example to be avoided in terms of the dominance of one economic sector over others. The selected proposals will represent alternatives to current practices in the cement industry in other regions of Lebanon.
- Devising future visions for the three sites to ensure they remain in the lives of all residents of the area, and rehabilitate their economic, social and environmental role.
- Finding sustainable and multi-disciplinary solutions to mitigate the environmental, health and economic damages resulting from the cement sector.
- Supporting the efforts of the local community and the existing movement
- Involving professionals in a national issue that has implications beyond the local level, by inviting them to take part in the competition with the aim of reinforcing a sense of involvement in public issues.
- Sensitizing officials and governmental authorities to the potentials of alternative development and promoting comprehensive solutions which put the environment, social justice and equitable development at the forefront of public policies.

2. Three Sites, One Vision

2.1. Ruptures and Continuities: Relations Between the Sites

The competition defines its geographic scope through three major sites that form a cross-sectional territory extending from the towns of Amioun and Bechmezzine westward (Caza of Koura), reaching the coastal towns of Chekka and Heri eastward (Caza of Batroun). [Appendices: 1.4.1 Sites Location Map / 7.4 Panorama Chekka Heri and Collar Towns / 1.4.14 Historical aerial_Koura_1956 / 1.4.15 Historical aerial_Koura_1962] Site A: the Chekka-Heri seafront; Site B: the Badbhoun quarry; and Site C: Koura's agricultural middle plain. Although administratively divided from their hinterland, the coastal towns of Chekka and Heri are considered by the competition to be part of one morphologically continuous landscape stretching from the hilltops and plains of Koura, down to the sea. [Appendices: 1.4.9 Map of Cazas and Koura's towns / 3.7 Chekka administratively divided from Koura: deadly or dying?]

The three poles of this perimeter were identified as strategic sites for intervention, as all three of them hold tangible traces of the negative impacts of the cement industry on the region, while at the same time retaining competitive advantages that constitute unique opportunities for envisioning and implementing sustainable and holistic development alternatives.

The sites are connected to each other in multiple ways.

Geographically, they are quasi contiguous, located less than 2 km away from each other.

As elaborated in the introduction, the very presence of the cement plants on the coast has been directly linked to the availability and extraction of raw material in the hinterland.

The AISabeh cement plant, located in the Chekka/Heri industrial zone in Site A, is today physically and operationally connected to the Badbhoun quarry in Site B, where limestone is extracted and carried down to the plant on a conveyor belt suspended over the North Lebanon highway.

Koura's agricultural middle plain (Site C) was once in a similar situation to Site B, whereby vast stretches of land were subjected to soil extraction activities by the cement companies in the 1960s until the mid 1980s. Having gone without rehabilitation to this day, the clay extraction pits and the state of agriculture in the plain testify to the damage that can result from failing to address pressing economic and environmental challenges at the regional scale, going beyond individual initiatives and municipal boundaries. They offer a glimpse into the future of Site B – should quarrying be halted and the site not rehabilitated. [Appendix: 1.4.11 Map of the spread of Ain Al Tawous]

On another level, the pollution generated by the different stages of cement production is carried from one site to the other by the air, water and soil, effectively linking these three sites on an ecological level: polluting substances travel from quarry to plain, from coast to hinterland, as dust and acid rain cause significant damage to crops, soil and water tables that trickle back down to the sea.

The interconnectedness of the sites on these multiple levels places them within one ecological system. For this reason, a project proposal for any site requires to be inserted into a broader vision for all three, where resulting synergies and relations can be made clear at the regional scale.

Further, the toxic ecology of the cement industry has effects that go beyond the geographic scope of the competition. The three identified sites can be considered epicenters, where any intervention has the capacity to radiate beyond the immediate context and impact the wider region.

[Appendix: 3.5 Legal Agenda 58 Koura]

2.2. Site A: Chekka-Heri Seafront

The seafront's competitive advantages can serve as a basis to provide a sustainable economic and development alternative to the current industrial model (and particularly cement) and those dependent on it, while limiting its negative environmental impacts.

- **Understanding the Site**

- Defining the Site

- Halfway from Ras El Chaqa'a to the Enfeh Peninsula, about 80 kilometers to the North of the capital Beirut, lies the site which is mainly composed of the coastal strip in Chekka and Heri, two adjacent towns administratively that are affiliated to the Caza of Batroun, but have always been considered a part of Koura's natural coast. [Appendices: 1.4.16 satellite_SiteA_2018 / 1.4.15 Satellite view seafront 1962 / 1.4.14 Satellite view seafront 1956 / 1.4.9 Map of Cazas and Koura's towns / 3.7 Chekka administratively divided from Koura: deadly or dying?]

- Chekka and Heri's municipal boundaries stretch from the sea towards the east, to the limit of the Koura hills where a group of small villages such as Zakroun, Badbhoun, Barghoun, Kfarhazir and Kefraya are located. [Appendices: 1.4.21 cadastral map Chekka / 1.4.22 cadastral map Heri]

- The two towns are bypassed by the highway and the old coastal road and disused railroad linking Beirut to Tripoli, and can be easily reached through their main entrances off the Beirut-Tripoli Highway or the Koura Caza roads located on the neighboring eastern hills, mainly Kfarhazir-Amioun highway.

Prior to the 1930s, Heri and Chekka used to rely on agriculture and marine activities such as fishing and salt mining. These main local economies were highly productive until two private cement factories were established respectively on Heri's coast in 1931 and on Chekka's coast in 1953.[Appendices: 3.1 Koura's land: from fertile resource to raw material for cement factories / 2.4 Livelihoods and the Job Market_AR]

Over time, the site has known multiple mutations, namely through the proliferation of industrial activities and repeated encroachments on its maritime public domain by recreational facilities such as beach developments and resorts. In parallel, it has suffered from the shrinkage of its agricultural lands and the expansion of urbanized residential areas near factories. [Appendices: 1.2.8 Landuses on the coast of Chekka and Heri/ 1.2.6 Seafront evolution 1956-2018 / 1.4.23 General map sites A-B (Chekka/Heri- Badbhoun) / 1.4.24 Topography map sites A-B (Chekka/Heri- Badbhoun) CAD]

In 2016, Heri hosted 1001 inhabitants, 969 of whom were registered voters, whereas 5000 voters were registered in Chekka and more than 7000 people are currently residing in the town.

Even with this considerable demographic density nearby a highly active industrial zone, no systematic health-based risk assessment has been conducted in Chekka and its surroundings, but previous field measurements coupled with chronic public complaints and media coverage have suggested a significant correlation between the cement industry emissions and the prevalence of adverse health impacts in the region.

Today, cement companies in Heri and Chekka report owning high efficiency particulate control devices; however, the actual operation of the filter is in doubt as suggested by local complaints indicating repeated occasions, most occurring during the night, whereby dense and dark smoke is released from some of the stacks.

Besides air and water pollution, to which Eternit's disused asbestos plant in Chekka contributes, industrial activities in the study area degrade various environmental components such as soil, fauna and flora.

[Appendices: 2.2 Coast Case: Pollution and Health Overview / 3.9 Heri beside Holcim, a sad story in a country that has abandoned its people / 7.1 Seafront photos]

Planning History

Before 1997, the General Master Plan for the Lebanese Northern Coasts, issued by Decree no.3362 in 1972, noted the presence of two cement

factories: Cimenterie Nationale - Al Sabeh in Chekka and Holcim in Heri, and introduced industrial areas in Chekka, Heri and Enfeh.

The master plan defined the industries without any sufficient transitional zones between them and the residential or green areas, and was a partial master plan, covering only the coastal portion of the towns and neglecting its relationship with its surroundings. Thus, the plan did not limit the expansion of residential areas in close proximity to industries, and did not think the relation of polluting industrial activities with public health or the existing and widespread agricultural land and economy.

In 1996, Decree 8010 was issued, and sought to solve the problem of incompatible land uses by suggesting regulatory standards for industries and by providing buffer zones to limit urban expansion in the vicinity of the industries. This master plan – the only one accounting for the specificities of Chekka and surroundings – was later weakened by two modifications (Decrees 716/2007 and 4598/2016) that primarily benefited the owners of industrial lands, particularly the two cement companies. Besides juxtaposing incompatible land uses, the modifications of the 1996 master plan enlarged the industrial zone and canceled regulations to diversify occupations industrial classifications.

[Appendices: 2.3 Coast Case: Planning and Zoning Overview / 1.1.1 Masterplans Chekka-Heri]

Larger Geographic Context

The Lebanese coast is legally established as a continuous public domain by Decision No.144 of the High Commissioner in 1925. With repeated violations of this provision through private encroachment, the reality of the coast as one ecosystem has nonetheless been demonstrated by different forms of cross-contamination between coastal Lebanese cities by domestic and industrial waste. For instance, the chemical plant in Selaata has been shown to affect water quality in all of Batroun's coast, reaching the shores of Chekka. [Appendix: 5.6 Selaata: Impact of Phosphogypsum and Other Factory Effluents on Meiofauna Communities of Batroun Coastal Region (2008)]

As such, although Site A forms a remarkable bay bordered by Ras El Chaqa'a, a natural barrier, to the South, and by Enfeh's to the North, it is still inscribed in the larger continuous shoreline, and cannot be treated in isolation. The exceptional value of this part of the Lebanese seashore is recognized by the National Physical Master Plan for the Lebanese Territory (NPMLT), achieved in 2005 and decreed in 2009. This plan proposes the creation of a natural reserve aiming at "the strict protection of the site of the cape and cliffs reserve of Ras El Chaq'aa". [Appendix: 1.4.13 NPMLT]

Any intervention scheme for the coast of Heri and Chekka should take into consideration the existence of this natural and religious picturesque landmark. Furthermore, the adjacency of the site to Enfeh, where wind wheels, salt marshes, fishermen ports and other historical and religious landmarks are threatened by the expanding privatization of the coast, should also be taken into account.

It is worth reminding that the case of the coast is directly correlated to the expansion of the quarries in the neighboring towns of Badbhoun and Kfarhazir, and historically to the clay extraction in Koura's Agricultural Middle Plain. Cement plants on the coast thrive on raw material sourced in the hinterland. The future of the coast of Chekka and Heri is ultimately linked to the future of the Badbhoun site, and any intervention on industrial emissions on the coast has the capacity to improve water and soil quality in the agricultural plain.

- **Current Problematic**

The Chekka-Heri case brief identifies a number of issues affecting the site and which should be addressed in submissions. These include:

Planning Issues

Zoning and Planning regulations for the industrial zone in both Chekka and Heri are set by the master plan issued by Decree no.716/2007. Remaining portions of Chekka's town are planned by Decree no.4598/2016, while Heri is still partially planned.

As stated previously, the site suffers from the juxtaposition of incompatible land uses, as buffer zones were not included in the master plans, and the proximity of urban expansion to the industrial zone was not controlled.

Entrants are expected to rethink land uses and the existing planning framework for the two towns in order to limit the impact of the industrial zone on the environment, particularly on marine life, health and agriculture. Interventions for this site are an opportunity to rethink industrial planning and regulations as part of a more holistic planning strategy based on sustainable, multi-sectoral synergies that could preserve and enhance existing practices and resources.

[Appendix: 1.2.13 Current Zoning Map in Chekka and Heri]

Local Economic Dependency on the Cement Companies

In response to the controversial record and negative perception of cement companies among local communities, the companies have a Corporate Social Responsibility (CSR) Policy whereby they support local authorities (Municipalities of Heri and Chekka and those of other affected towns)

through funding infrastructure projects and sponsoring community events (local festivals, summer camps, etc.). Also, donations made by Holcim and Cimenterie Nationale to local sports clubs, fishermen associations, local schools and environmental programs, suggest that a number of activities depend on these companies financially in the absence of institutional support.

[Appendix: 2.1 Overview of the Number of Workers in Cement companies and the Projects funded by the Companies in affected towns]

In addition, a considerable number of residents in Chekka and Heri' work for the companies, and the cement industry represents their main source of income. Working for the cement companies has also become highly coveted by fishermen, farmers and fresh graduates in Chekka and Heri, as they provide fixed wages, social security and financial aids for their employees.

[Appendix: 2.4 Livelihoods and the Job Market_AR]

Since livelihoods became largely limited to industries, with some opportunities in recreational and commercial facilities, entrants are to consider ways to stimulate and diversify economic activity within the site by proposing a more balanced and sustainable economic model based on Chekka and Heri's competitive advantages as alternatives to the existing model principally based on the cement industry and the exploitation of quarries.

Industrial Process

Through the years, Cement companies in Heri and Chekka established new production lines and replaced old equipment to increase production. Companies claim that yearly investments are made to improve the plants' environmental performance and mitigate the environmental impacts of their operations. (Refer to companies' websites: [Cimenterie Nationale](#), [Holcim Lebanon](#)) [Appendix: 3.4 International Report about Cement Production in Lebanon (2016)]

However, as mentioned previously, the actual operation of the particulate control devices and filters is in doubt by locals who accuse the companies of violating Lebanon's Law No. 444 for Environmental Protection. [Appendix 4.10 Environment Protection Law244662]

Entrants are encouraged to propose regulatory standards, relook into the cement companies' production process and propose, if available, alternative new technologies or devices that limit environmental damages resulting from emissions, but also from unsustainable quarrying processes. This intervention can include recommendations for the national industrial policy.

- **Stakeholders**

The competition understands the stakeholders in Site A as follows:

Decision-makers:

- Government Authorities: Ministry of Industry, Ministry of Environment, Ministry of Health, etc.
- Cement companies: Cimenterie Nationale and Holcim (Chairmen, Board of members, Shareholders, etc.).
- Municipal bodies: Municipality of Chekka (and its environmental committee), Municipality of Heri.
- Self-Governed Bodies: Chekka's Development Council, etc.
- Local Political Parties

Vulnerable Affected Groups:

- Cement plants' employees and contractors
- Social groups residing or working in the plants' implementation area (Chekka, Heri and nearby affected towns)
- Fishermen and fishermen cooperatives in Chekka, Heri and nearby towns (Anfeh, etc.)
- Owners of shops and restaurants in Chekka and Heri and their clientele
- Owners of resorts in Chekka and Heri and their clientele
- Local Sports Clubs and NGOs

[Appendices: 1.3.2 Mapping of Stakeholders in Koura's cement industry / 3.6 Civil Movements in Koura]

2.3. **Site B: Badbhoun's Quarry**

Intervention scenarios for the Badbhoun quarry can use multiple tools to reduce its spread and impact and propose tracks for its rehabilitation on the bases of social equity, environmental justice and economic sustainability. Proposals can constitute strategic prototypes for addressing other similar quarry sites and can put forward tools to resist environmental threats facing other unplanned towns of low demographic density.

- **Understanding the Site**

Defining the Site

The site's main component is a limestone quarry spreading across 1057159 sqm of previously cultivated mountainous land. [Appendices: 1.4.17 Badbhoun Aerial View 2017 / 1.2.1 Previous landuses in and around the quarry] To the south, it is bordered by the municipal bounds of Chekka and Kfarhazir, and by the Kfarhazir- Amioun highway, a high-speed, mostly commercial road and the primary artery connecting the coastal areas to the hinterland of Koura and to major destinations such as the Cedars and Ehdén. To the north, the quarry borders the

remaining wild and cultivated lands of Badbhoun, as well as the small residential center of Badbhoun, consisting of less than 30 houses, a few small groceries, a mosque and a cemetery. [Appendix: 1.2.9 Current landuses in Badbhoun / 1.4.23 General map sites A-B (Chekka/Heri-Badbhoun) / 1.4.24 Topography map sites A-B (Chekka/Heri- Badbhoun) CAD]

Today, the Badbhoun quarry takes up a quarter of the town's territory (4'482'633 sqm). Most of the plots in and around the quarry (88.5 percent) are owned by the Cimenterie Nationale (AISabeh) whose cement plant is located on the coast of Chekka, connected to the quarry by a conveyor bridge. For every three square meters of private property in the town, the company owns over one square meter. It has only quarried part of its lands so far. [Appendix: 1.2.2 Plot ownership in and around the Badbhoun Quarry]

Badbhoun does not have a municipality, and is characterized by a low demographic density: in 2002, it hosted 268 inhabitants, 120 of whom were registered voters. Administratively, it falls under the jurisdiction of its *mukhtar* and of the *qaimaqam* of Koura.

Synthesis of Planning History and Environmental Damage

Historically a marginalized unplanned town that didn't benefit from government services until the 1960s, Badbhoun fell prey to relentless exploitation by the Cimenterie Nationale who managed to circumvent urban planning regulations as well as many other legal obstacles. Over the years, Badbhoun suffered from quarry dust, depletion of its water supplies, and the destruction of its homes. This was enabled by an unprecedented decision issued by the Council of Ministers in 1997 declaring the adoption, allocation, and zoning of the entire town of Badbhoun as a special area for the quarries of the cement companies for a period of ten years, later extended for an additional two years. However, the resulting environmental damage was not confined to Badbhoun's administrative bounds; it radiated over the surrounding towns of Kfarhazir, Chekka, Fiih, Afsadik, Bechmezzine, Barghoun and Amioun.

Today, there is no master plan in effect for Badbhoun. The last master plan for the town dates back to 2011 and was issued by a decision from the Higher Council for Urban Planning. In February 2016, the master plan was suspended after the Cimenterie Nationale filed a lawsuit at the State Council, having realized that the plan was an obstacle to the expansion of its operations.

Appendices:

- 3.1 Koura's land: from fertile resource to raw material for cement factories
- 1.2.5 General map of Current Zoning in Chekka and Surrounding towns of Koura
- 1.1.2.B Map of Badbhoun's Zoning according to Decision 18/2011
- 1.1.2.A Master Plan of Badbhoun 2007
- 4.4 State Council Review concerning Badbhoun No. 348:2015-2016 Cimenterie Nationale vs HCUP
- 1.3.3 Timeline of the cement companies' expansion

National Master Plan for Quarries

The larger legal framework governing the site is the National Master Plan for Quarrying issued by decree 2366/2009, which determines areas suitable for establishing quarries across the Lebanese territories. [Appendix: 4.7 Decree and master plan for quarries 2009] However, the site is in stark contradiction with all provisions included in the decree and its master plan, sitting outside the defined allowable zones. The allowable zones of the decree themselves contradict the study for the Lebanese National Physical Master Plan, casting doubt over the adequacy of the decree map as a whole. [Appendix: 3.2 Reading the Quarries Map in Lebanon]

Effectively, the quarry does not operate under any valid quarrying license. In early March 2019, newly appointed Minister of Interior Raya el Hassan issued a decision to halt operations in all unlicensed quarries. This suspended work in the Badbhoun quarry for some weeks, until an administrative extension of 3 months was subsequently issued by the Council of Ministers, to allow for the Ministry of Environment to develop a new quarrying policy that would include provisions for addressing existing quarries of different legal statuses. [Appendix: 4.3 MoE_draft of national policy for quarrying 2019] This policy has not yet been approved by the Council of Ministers, while unlicensed quarries continue to operate across Lebanon. However, the policy is an opportunity to rethink the relationship of quarrying with economic policies, local and regional real-estate economies, the absence of planning on 85% of lebanese territories and other urban planning regulations that produce sprawling urbanization and widespread land reclamation projects along the Lebanese coast. [Appendix: 3.3 The General Directorate of Urban Planning- Arbitrary Practice Between the National Master Plan, General Master Plans, Exceptions, and Decisions]

Larger Geographic Context

The Cimenterie Nationale quarry in Badbhoun is paralleled a few kilometers away by the Holcim quarry, stretching across land zoned residential in the neighboring town of Kfarhazir, and connected to the Holcim cement plant on the coast of Heri. [Appendix: 1.2.12 Spread of Kfarhazir quarry / 1.2.11 Spread of Badbhoun Quarry] The possibility of unfettered quarry expansion in the hinterland has been a key condition for the plants to thrive on the coast. Both quarries and the plants associated with them have had a catastrophic impact on water, air and soil quality, resulting in deteriorating health, agriculture, and development prospects. Finally, the visual impact these two quarries have on the landscape goes without mentioning. [Appendix: 7.2 Badbhoun quarry Photos]

In that sense, the intervention on Site B requires a reevaluation and redefinition of the relationship between cement plant and quarry, between coast, hinterland and plain.

- **Current Problematic**

Today, Badbhoun is home to those who do not have alternatives, and to those who are seeking to reclaim their town and protect what remains of its landscape, supported by surrounding towns that are negatively impacted by the cement industry. In addition to the overall strategic vision for the area, the competition calls for multi-scalar and interdisciplinary interventions that address the following site-specific issues:

- Planning and Land Ownership:

What legal, economic and planning tools can be used to intervene in a land monopoly, within a vision that is contextual and relevant to residents' needs and aspirations? Proposals for Site C should tackle the spatial relationship between the quarry and the town by putting forward preliminary schemes to limit the spread and impact of the quarry on the town and its surroundings. Proposals should take into account that most of the land in and around the quarry belongs to the Cimenterie Nationale - AISabeh company, and propose planning tools and mechanisms to reclaim this site for the public good.

- Quarry Rehabilitation and Economic Sustainability:

How can the rehabilitated quarry redefine its productivity by hosting a sustainable economic alternative for the town and the wider context? The unique morphology of the site and its relation to the surrounding landscape warrant the development of design proposals that build on the competitive advantages of the site and devise rehabilitation schemes on the bases of social and environmental justice and economic sustainability.

- Replicability and National-scale Policy:
How can intervention schemes in Badbhoun serve as a replicable prototype and inform a larger-scale approach to quarry sites? Proposals should take into account the proximity of the Kfarhazir quarry and its similarities with the site, and identify potentially scalable or replicable approaches. Reflections and suggestions pertaining to the national-scale quarrying policy are also highly encouraged. The case of Badbhoun is also an opportunity to think of tactics for countering environmental injustices taking place in other small unplanned towns of low demographic density, with no municipality to represent them administratively. [Appendix: 1.4.12 Map of the towns without Municipalities / 4.6 Archival Poster Zakroun]

Appendices:

- 5.8 Environmental Impacts of Quarries on natural resources in Lebanon
- 5.7 Assessment of Abandoned quarries for revegetation and water harvesting in Lebanon
- 5.1 Using Fiscal Instruments to Control Quarry Proliferation
- 4.2 Cimenterie nationale current and future production

- **Stakeholders**

The competition understands the stakeholders in Site B as follows:

Decision-makers:

- National Authorities: Council of Ministers, Ministry of Environment, etc.
- Local Authorities: Qaimaqam of Koura, Qaimaqam of Batroun, Union of Municipalities in Koura, Urban Planning Department in Koura, *mukhtar* of Badbhoun.
- Self-Governed Bodies: Koura's Development Council.
- Cimenterie Nationale - AISabeh.
- Local Political Parties.
- Transportation contractors.
- Owners of unquarried land adjacent to the quarry*.
- Workers in the quarry*.

Impacted Negatively:

- Residents of Badbhoun
- Residents of surrounding towns (Afsadik, Chekka, Kfarhazir, Barghoun, Fiih, Amioun, Bechmezzine)
- Owners of agricultural land in Badbhoun and surrounding towns
- Commercial strip along Kfarhazir-Amioun highway
- Owners of land adjacent to the quarry or in its vicinity*

- Workers in the quarry*

[Appendices: 1.3.2 Mapping of Stakeholders in Koura's cement industry / 3.6 Civil Movements in Koura]

Other Appendices for Site B:

- 1.4.3 Barghoun Cadastral Maps,
- 1.4.2 Badbhoun Cadastral Map,
- 1.2.3 Years of land acquisition in and around the Badbhoun quarry
- 1.3.1 Quarries legislative process
- 1.2.7 Comparing quarry sites to the master plan for quarrying and the NPMP
- 1.4.13 National Physical Master Plan for Lebanese Territories

2.4. Site C: Koura's Agricultural Middle Plain

The proposed intervention for the plain is expected to operate within a holistic strategy based on sustainable models of rehabilitation. Situated within bigger challenges for agriculture on the national and local scale, scenarios for this area need to address the neglected clay extraction pits. How can the plain's role be redefined based on the challenges of integrity and productivity and its relevance to current and upcoming generations of Koura residents?

- **Understanding the Site**

- Defining the Site

- The agricultural plain that extends from Amioun in the south to Tripoli in the north, is one of the biggest continuous inner plains in the country, and has been recognized by the National Physical Master Plan for Lebanese Territories (2009) as an agricultural domain of national interest [Appendix: 1.4.13 National Physical Master Plan for Lebanese Territories]. The part located in the district of Koura holds 20% of Lebanon's olive trees. In 1967, the Lebanese Cement Factory started extracting red clay from Koura's agricultural Middle Plain in order to produce cement through what was then called the wet process.

- The soil extraction continued until 1984, resulting in excavated pits as deep as 25 meters, completely emptied the soil, and damaged land in the towns of Amioun, Bechmezzine and Btorram. Extraction was stopped by force after fierce resistance from residents, backed by political parties. [Appendix: 4.5 Archival Poster Plain]

- These large and degraded holes were never rehabilitated. Consequently, they had dramatic ramifications on agriculture in Koura's middle plain and surrounding territory. Over the years, they have turned to swamps, increasing the humidity level in the entire plain and subsequently aggravating the spread of the fungal disease "olive peacock spot"

(*Spilocaea Oleaginea*) that has been infesting olive trees as far as four kilometers from the holes.

For the competition, the site of the plain is delineated by the most affected towns and where the holes continue to constitute a source of danger to residents and a threat to the thriving of agriculture in the plain.

[Appendix: 7.3 Koura middle plain photos / 1.4.18 Satellite _site C_2017]

[Appendix: 2.5 The plains characteristics and types of plantations^[A1]]

Agricultural Activities in the Plain

Historically, landowners and farmers from Akkar worked the land in exchange for oil, and distribution of the remaining produce depended mainly on personal contacts or traders who had to handle transporting the oil stored in big containers at the mills. Though the potential of the olive industry was growing since the 1950's, there were no efforts to modernize the production and capitalize on it. Instead, in the mid 1960's, middlemen contracted by the cement factories, who were either from Zgharta or from Koura, started purchasing farmers' lands, or directly purchased the clay soil itself when farmers were reluctant to sell their properties.

Residents claim that 200,000 olive trees were pulled out in the process, out of the approximately 2 million trees in the plain. A pit with a surface area of 1 million square meters was dug out by the cement companies in Amioun alone, in the midst of 9 million square meters of agricultural land. Other smaller pits spread in Bechmezzine, Btorram and Kfarhazir, amounting to a total of 2 million square meters.

These holes drastically changed the habitat of the agricultural plain. The humidity, coupled with the dust emanating from the nearby quarries and factories on the seashore, affected the productivity of the remaining olive trees. In Summer, the pits suck up the retained water in the more elevated soil, drying the roots of the surrounding olive trees. There were several attempts to restore the land, such as leveling the pits using rubble and building debris from nearby villages, but the quantities were not sufficient to fill them. Attempts to drain the water retained in the pits failed as well, as the depth of the holes exceeded the level of existing drainage systems. Some parts have been used as dumpsters for untreated waste, and there was a suggestion to contract Sukleen, a private waste management company, to plan a compost landfill that would have required 3 years to complete, but the proposal was never carried through.

The fungal disease that spread in the plain [Appendix: 1.4.11 Map of the spread of Ain Al Tawous] due to the increased humidity has been a serious recurring problem, as well as deteriorated land whose owners lack guidance on how to restore its productivity and assess what to plant. While the holes themselves have enabled new activities and small-scale

initiatives, many of these have been either harmful to the existing agriculture or have failed to introduce new uses. Previously absent from the activities of the plain, cattle and sheep were introduced but proved to be harmful to adjacent crops. Individual initiatives for agricultural projects included planting avocados, apples, onions and reintroducing almonds, as well as beekeeping. Many of these projects were discontinued. Other types of new uses include a horseback riding initiative in Amioun, and the construction of a residential cluster in Btorram where displaced families from Diniyye bought land in 1984 after it was excavated for clay. The changed habitat introduced new flora as well, transported by migrating birds attracted by the accumulated water^[1]. Duck hunting also became an activity in the plain.

[Appendices: 1.2.10 Landuses in and around Koura's middle plain / 1.4.10 Map of Soil Types in Koura's Middle Plain (1970) / 5.9 Average annual pluviometry for Lebanon 2012]

Planning History and Challenges

Prior to the 1960s, the study area had no land use regulations, only land's morphology and the soil's characteristics determined how landowners exploited their plots.

While Bechmezzine and Bterram remain unplanned until today (Refer Study FF1), Amioun was planned for the first time in 1968. Decree no.9311/1968, issued by the DGUP, defined residential and commercial zones along the main Amioun-Kfarhazir road, and classified the rest of the town – despite decades of agricultural use –as first, second and third “extension areas”, thereby allowing future urban expansion in them.

That classification was problematic in itself. In fact, North Lebanon has experienced a move towards a “geographical decentralization” during the civil war, which led to a strengthening of Amioun's position as an administrative center of the Koura Caza.

Consequently, the town recognized an urban growth linked to a residential expansion in first and second extension areas. Luckily, the agricultural productive function of the majority of the third extension area (E) was then unintentionally preserved, not so long before the clay's extraction quarries became operational in it and in nearby towns.

In 1995, a new Master Plan for Amioun was issued by Decree no.6743. Newly additional zones were mainly mixed-use (residential, commercial and touristic), and for private housing. Furthermore, a weak protection was observed for the existing agricultural lands due to the conversion of the “third extension area (E)” to an “Agricultural Area” by name even though the exploitation ratios remained as in Decree 9311/1968.

Over the following years, the Municipality of Amioun had to struggle hard to secure approval of its own proposal for the general guidance and zoning plan, as the Directorate General of Urban Planning strongly objected to it. The proposal banned building inside olive and fruit orchards

and encouraged the use of the land on rocky and hilly sites overlooking these fields for building purposes.

In 2002, the DGUP responded to the concerns of the municipality and issued Decree no.8131, in which exploitation ratios in the agricultural zone were decreased to minimal values (a touristic zone and an archeological zone were newly defined too, while archaeological excavations are still ongoing).

Since then, debates never stopped in Amioun. Triggered by the decrease of the productivity of the olive groves and the low land prices compared to the residential/commercial zones, the majority of owners in the agricultural plain started to pressure towards amending the 2002's Master Plan, or more precisely towards increasing the exploitation ratios of the plots in the classified agricultural zone.

Today, Zoning and planning controls for Amioun are still contained in that latter master plan, while Bterram remains unplanned and Bechmezzine remains object to arbitrary planning and uncontrolled urban expansion in agricultural lands for the reason that Decision no.31/2011 and Decision no.11 in 2012 issued by the DGUP were not followed by the issue of a decree within the legal time limit, which in principle renders the two decisions invalid and ineffective.

Appendices:

- 1.1.3 Master Plans of Koura's Middle Plain (Amioun, Bechmezzine, Bterram)
- 1.2.14 Current Zoning Map in Koura's Middle Plain
- 4.12 The North Lebanon Project NOLEP

- **Current Problematic**

The agricultural potential of the plain is threatened by diminished productivity, and challenges pertaining to the agriculture sector in general. The competition calls for site specific intervention that is anchored within a larger vision, taking into consideration the local as well as the National scale.

National Scale Policies on Agriculture

Farmers of small-sized plots have been the most affected by the challenges facing the agricultural sector of the plain. While previously, a substantial income could be secured from planting olives^[2], farmers now consider agriculture a burden. Besides the direct challenges outlined above, the lack of support or inefficiency of institutional setups and governing bodies to enable cooperation between farmers, coupled by regulations and policies that favor other economic sectors at the expense of agriculture, have clearly affected the potential of the plain.

Trade agreements^[3] since the 90's have affected the local market demand: imported oil was allowed to compete with locally produced oil at cheaper prices, and exports became limited due to a lack of regulations which ensure alimentary standards required by several countries are met. On the other hand, trade regulations have protected the interests of the cement factories by enabling a local monopoly and restricting the import of cement, which kept local prices very high in comparison to the global market, as well as allowed for systematic destruction of the environment [Appendix: 3.1 Koura's land: from fertile resource to raw material for cement factories]

Concurrently, Lebanese farmers have increasingly refrained from working the land in favor of alternative work opportunities that grant social securities, such as joining national security forces, or seeking employment in other sectors. Today, the main workforce in Koura's agricultural sector has become Syrian, and although paid exploitative low wages, the cost of production for small farmers is exceeding the cost of sale and preventing them from making any profit or sometimes breaking even.

Although agriculture cooperatives are many, they are deemed as inefficient or corrupt by local agricultural communities. Some farmers claim that their sheer number has been counterproductive and has impeded real cooperation between farmers and their ability to have political power. Functional cooperatives could provide the agricultural guidance needed and the tools to support the farmers.

[Appendix: 4.11 Cooperatives law]

Redefining the Productivity of the Plain

Since 1967, the excavated pits imposed drastic environmental changes on the plain aggravating challenges to agriculture as a viable sector in the area. Although the demand for olive oil has expanded over the years and Lebanese oil has particularly gained international recognition, the farmers of Koura have been increasingly burdened by the olive crops. There have been several attempts by younger generations to diversify production in the middle plain adapting to the new habitat of the swamps, however these initiatives proved unsustainable.

This case solicits scenarios/models that take into consideration the agriculture value chain and builds on local capabilities to create livelihoods opportunities.

- **Stakeholders**

The competition understands the stakeholders in the Middle Plain of Koura (Site C) as follows:

Impacted Negatively:

- Farmers dependent on olive plantations
- Owners of agricultural land in the plain
- Owners of olive oil presses
- Owners of factories of olive oil soap and other related products
- Agricultural cooperatives in Koura

Decision-makers:

- Union of Koura municipalities
- Relevant municipalities: Amioun, Bechemzine, Batram
- NGO: Council for the Development of Koura
- Landowners in the perimeter of the holes
- Professionals in related fields: agriculture, economy, landscape, planners, etc..

[Appendices: 1.3.2 Mapping of Stakeholders in Koura's cement industry / 3.6 Civil Movements in Koura]

General Appendices for Site C:

- 1.4.4 Cadastral Map of Amioun (AutoCAD Format)
- 1.4.5 Cadastral Map of Bechmezzine (AutoCAD Format)
- 1.4.19 Amioun Bechmezzine - Topographical map 1960s
- 1.4.20 Amioun Bechmezzine - Geological Map 1960s^[2] ^[d3] ^[d4] ^[d5]
- 6.1 References

^[1] Wikiwand.com

^[2] One farmer who owns 100,000m² of dispersed plots, with approximately 20 trees per 1,000m², used to produce between 600 and 700 “tanke” olive oil. Nowadays, he barely extracts 100 ‘tanke’. A “tanke” used to be sold between \$100 and \$150. The price has reached \$180 in the last few years.

^[3] [Tayseer agreement - Greater Arab Free Trade Area \(GAFTA\)](#)
[Lebanese customs article](#)
[Al Modon article](#)

3. Competition Requirements and Conditions

3.1 Structure and Jury Deliberation

3.1.1 Competition Organizer and Supporters

The competition is organized by Public Works Studio in collaboration with the Order of Engineers & Architects in Beirut and Tripoli and under the auspices of the Union of Koura Municipalities. The coalition of these three entities, referred to herewith as the 'Organizer', is the organizing and awarding party of this competition.

3.1.1.1 Steering Committee

The Organizer formed a steering committee to help develop the competition brief and oversee its overall content. Working on a pro bono basis, the role of this committee also includes:

- Nominating the jury members.
- Developing a proposed list of evaluation criteria to facilitate the work of the jury members.
- Meeting with jury members prior to the jury deliberation sessions to share ideas about the competition challenges.
- Seeking the support of key members and establishments in the society for sponsorship and/or endorsement of the competition.
- Participating in formulating responses to competitors questions.
- Attending the jury deliberation sessions, but as silent advisory with no voting rights, to provide advice to the jury on various issues, upon request.
- Advising on the exhibition and publication.

The committee is comprised of multidisciplinary professionals with expertise in planning, architecture, landscape architecture, agriculture, environmental sciences, economics, law, and communications, some of whom with thorough knowledge about the study area and some others are members of the Organizer's team. The list [SM1] of the Competition Steering Committee members along with their title/field of expertise is:

Tala Alaeddine - Architect and Urban Researcher [Public Works]

Yaser Abu Nasr - Architect, Landscape Architect and Regional Planner [American University of Beirut]

Monica Basbous - Architect and Spatial Analyst [Public Works]

Nadine Bekdache - Designer and Urbanist [co-founder of Public Works]

Ali Chalak - Agriculture Engineer /Associate Professor of Applied Economics/Faculty Undergraduate Coordinator for the Agribusiness Program [American University of Beirut]

Talal Darwish – Agriculture Engineer/Environmental and Soil Scientist/ Director of Research [CNRS- Conseil National de la Recherche Scientifique].

Habib Debs - Architect and Urban Planner [Urbi]

Moussa Ghantous – Mechanical Engineer/Agriculture Specialist/Public Issues Activist from Koura [Independent Professional]

Roula Khoury – Architect and Urban Planner [Lebanese American University]

Souheir Assi Mabsout –Architect and Urban Designer/Professional Competition Consultant [Independent Professional]

Lara Maddah - Legal researcher [Legal Agenda]

Jessica Najem - Environmental Health and Climate change Specialist/Scientist [Independent Professional]

Samar Najjar –Physicist/Researcher/Environmental Activist from Koura [Independent Professional]

Abir Saksouk - Architect and Urban Planner [co-founder of Public Works]

Saphia Shamas – Landscape Architect and Urbanist [Public Works]

** Biographies of steering committee members can be found on the competition website.*

[\[www.beyondcement.org\]](http://www.beyondcement.org)

3.1.1.2 Competition Professional Adviser

Ms. Souheir Assi Mabsout has been appointed by Public Works to provide professional guidance on the overall management and conduct of the competition, as well as on the formulation of the competition's requirements and conditions.

3.1.1.3 Competition Coordinator

The Organizer hired Ms. Saphia Shamas (until Sept. 2019), then Ms. Tala Alaeddine as the Competition Coordinator, referred to here as the 'Coordinator', whose role is to coordinate the competition activities and disseminate related information to the participants, organizing committee, and jury members.

The Coordinator may be contacted at the following email address info@beyondcement.org

3.1.2

Competition Type

The competition is a single-stage design 'Ideas Competition' open to national and international interdisciplinary professional individuals, teams, firms and academic institutions and students.

It is an open call for inclusive alternative visions, solutions, and advocacy strategies that will be curated in a public exhibition with a publication. The competition entries will be reviewed by a jury panel of local and international experts that will select a number of projects to be included in the publication and exhibition. The exhibition and publication aim at raising awareness and starting a public discourse that can form broad coalitions to advocate for an inclusive and livable environment, through

the alternative development visions and solutions for Chekka and the Collar Towns affected by lack of planning, environmental hazards, and non-inclusive public policies. The competition is a platform for an open-ended debate about a crucial urban and environmental issue at the scale of the country at large.

3.1.3 Eligibility

The competition raises issues that call for skills in urban, environmental, ecological, and agricultural planning, in addition to design, social sciences, economics, and public policies. Thus, interdisciplinary 'thinking and a holistic approach of teams (of professionals, students or combination of both) is very essential for the success of proposals. Teams are encouraged to include at least one member with expertise in the planning/design field (urbanist, planner, architect, landscape architect), and one member in the ecological and environmental sciences field; in addition to members in other fields related to social sciences, economics, and public policies. Teams are also encouraged to include at least one local representative in the Chekka/Koura region as well as members representing national and/or international perspectives on planning in similar urban contexts.

Members of the Organizer team, Competition Steering Committee, Jury, as well as their associates or and relatives, or any person who has been involved with the preparation or organization of the competition, shall not be eligible to enter the Competition or assist a participant in this competition.

3.1.4 Jury Panel

A jury of multidisciplinary professionals and experts will work on a pro bono basis to review the submissions and select a number of projects to be included in a publication and an exhibition.

Members of the Jury* are:

Raghd Assi Social and local program development manager [UNDP]

Karim Bou Karim Mechanical Engineer - Head of the Union of Koura Municipalities.

Rania Ghosn Associate Professor of Architecture and Urbanism [MIT]

Kanj Hamadeh Assistant professor of agricultural economics and rural development [Lebanese University]

Adib Kfoury Assistant Professor, Department of Environmental Sciences [Balamand University] Environment Committee member and advisor [Chekka/Koura]

Carla Khater PhD - Associate Researcher in National Council for Scientific Research-Lebanon (CNRS-L).

Jala Makhzoumi Professor of Landscape Architecture/Lebanese Landscape Association, President [Independent Consultant]

Bassam Ziadeh Mechanical Engineer - Head OEA North

Nizar Sagiye Lawyer, co-founder and executive director [Legal Agenda].

Jad Tabet Architect - Head of OEA Beirut

The jury members shall agree to and sign the **Jury Member Agreement** (Appendix 8)

* *Biographies of jurors can be found on the competition website www.beyoncement.org*

3.1.5 Award

The competition is a starting point for visioning exercises that can build broader coalitions based on an advocacy strategy for inclusive, sustainable, and livable environments. The jury panel will select a number of projects to be included in a publication and an exhibition. The exhibition and publication aim at raising awareness and encouraging a public debate promoting alternative visions and solutions which have implications at the national level beyond the competition area.

The competition will also include a monetary award, certificates of achievement, and honorable mentions. The distribution of the amount among the winners will be decided by the jury.

3.1.6 Evaluation Criteria

The successful entry(ies) will be selected primarily to the extent it (they) meets the requirements set in this competition brief and in the addendum that could be made available as a result of the question and answer period.

Participants are encouraged to explore and present innovative, creative and sensitive proposals that best respond to the urban development needs at the regional and specific site levels, in line with the Organizer's requirements. Participants are equally encouraged to reflect on the legal and policy aspects and to propose alternative

solutions that would be conducive for opening a constructive debate in support of crucial law reforms.

To this end, evaluation of the entries will be based on the following criteria, among other factors as deemed necessary by the Jury:

- Responsiveness to key opportunities and challenges facing Chekka and the Collar Towns, as well as to the overall goals of the competition.
- Coherence between the general vision and intervention strategies at site level.
- Implementable solutions with potential for transformative impact at site level, region level, and beyond.
- Sensitivity of intervention(s) to the urban and ecological context and suitability for sustainable future growth.
- Replicability potential of solutions to other sites in Lebanon with similar challenges.
- Relevance of legal mechanism, planning and implementation tools that support the proposed intervention strategies.
- Diligent reflection on the current relevant national public policies and recommendations for potential improvement.
- Strength and Clarity of the advocacy strategy.
- Multidisciplinary of team structure and approach.
- Overall strength, clarity, and comprehensiveness of the proposal.

3.1.7 Timeline

3.1.7.1 Schedule

The competition schedule and the due dates of respective milestones are listed in the table below.

Activities	Dates
Official Launching of Competition. Start of Registration. Posting of the Competition Brief on the website.	Monday, September 16, 2019
Competition Launching Event at OEA Beirut.	Monday, September 16, 2019
Competition Launching Event at OEA North	Tuesday, September 17, 2019

End of Registration	Tuesday, October 15, 2019
End of Question Period	Friday, November 8, 2019
Final Compiled Reply to Questions	Friday, November 15, 2019
Deadline for Submission of Entries	Friday, February 28, 2020
Jury Deliberation*	March 2020
Announcement of Finalists/Press Release*	March 2020
Publication, Exhibition, and Conference*	March / April, 2020

**The exact date and time maybe subject to change and/or will be confirmed and communicated at a later stage.*

3.1.7.2 Detailed Descriptions of Competition Activities

a. Launching of Competition and Registration

The official launch date of the competition is on **Monday, September 16, 2019**. It is the date on which registration is officially open and the electronic copy of the Competition Brief shall be posted on the website from which it can be downloaded. Hard copies will not be available. Individuals, firms or teams wishing to participate in the competition will need to complete their **registration online prior to the closing date on Tuesday, October 15, 2019**.

Two launching events/press conference to publicize the competition and answer questions by media will be held on the following two consecutive days:

- **Monday, September 16, 2019** at the Order of Engineers and Architects (OEA) in Beirut.
- **Tuesday, September 17, 2019** at the Order of Engineers and Architects (OEA) in the North (Tripoli).

b. Registration

Registration by interested teams for this competition will be closed on **Tuesday, October 15, 2019 at 5:00 PM Beirut time**. Teams are

expected to include multidisciplinary expertise as explained above under Eligibility (refer to section 3.1.3)

c. Question and Answer Period

Registered teams will be able to communicate with the Organizer for further inquiries and/or clarification starting the date of the registration in the competition on **Monday, September 16, 2019**. All communication between the participants and the Organizer with regard to the competition should be submitted in writing (either in English or Arabic) to the Coordinator. The closing date for receiving questions is **Friday, November 8, 2019**.

Questions received after this date will not be considered. Queries addressing specific clauses of the competition brief must reference to the clause in question.

All questions shall be sent to the Coordinator by email to the following address: info@beyondcement.org

d. Reply to Questions

The Coordinator will acknowledge receipt of queries and will respond to questions asked by each participant in writing in a timely manner. All questions and answers will also be compiled in a summary document and dispatched to all participants through the website and by email at the end of the Q&A period on **Friday, November 15, 2019**. This document shall be considered as an addendum to the competition brief, thus an integral and officially binding part of the competition.

e. Submission of Entries

The deadline for the submission of competition entries is **4:00 PM Beirut time on Friday, February 28, 2020**. Entries may be delivered by hand or by mail using fast courier service to ensure prompt delivery. Entries sent by mail must be received by the fast courier service and postmarked no later than **February 28, 2020**. Participants are responsible for all postage, shipping, and insurance charges, and for ensuring timely delivery. The Organizer will not accommodate for delays due to mailing service or for any damage or loss caused in the mail or handling in transit.

Entry packages shall respect the Anonymity Procedure (refer to section 3.3.2). Detailed instruction guidelines for the submission procedure (labeling, submission address etc.) will be distributed to participating teams at a later stage.

f. Jury Deliberation

The Jury members are expected to convene during **March 2020** to judge the entries. The deliberations may extend over 1 or more days if needed. Jury deliberation will be hosted by the Order of Architects and Engineers in Beirut.[SM7] Any changes to these dates will be announced.

The jury decision will be documented in a 'Jury Report' which will be signed by each member of the jury.

g. Announcement of Finalists and Press Release

The Organizer will notify the participants of the results of the competition, and send them a copy of the jury's report. The selected entries and jury report will be simultaneously announced in a press release prepared by the Organizer during March 2020*. The jury report will also be posted on the competition website.

**The exact date and time will be confirmed and communicated at a later stage.*

h. Publication, Exhibition, and Conference

After the announcement of the results of jury deliberation, the Organizer will document the outcome of the competition in a publication, organise a conference, and set up an exhibition of all entries for public viewing. The aim is to involve the community at large (including but not limited to the local community, concerned public officials, professionals, etc.) in the visioning process and to solicit their feedback in order to help guide future development strategies and public policies along the proposed alternative visions and solutions. A touring exhibition will follow and the selected entries will be exhibited in multiple venues and events to promote wider public awareness. The exact date and venues will be confirmed by the Organizer in due time.

3.2 **Submission Requirements**

The competition is soliciting creative, sensitive, comprehensive alternative visions and feasible solutions that are based on the principles of sustainable development at the social, environmental, and economic levels, and that are governed by the principles of social justice instead of limited economic interests, with the objectives to build on the outcome to serve as an advocacy tool for promoting public awareness and making a transformative impact at the sites, region, and beyond at the national level.

As previously elaborated in this brief, participants are asked to structure their entries by addressing the three main interrelated components:

1. *At regional scale:* **General Vision**, covering all three sites.

2. *At site scale (limited to one of the three sites):* **Intervention Strategies and Solutions**, at any scale within the scope of the selected site. The intervention at site level could include a site vision, policy recommendation, a spatial/design intervention, a development plan, a program or a combination of all.

3. *At either scale:* **Advocacy Strategy**, that stretches across the site level, regional level and beyond.

Entries are expected to be presented including spatial configurations and/or graphic representation as well as urban, environmental, economic, and institutional policies and proposals capable of balancing between social, environmental, legal, and economic needs. Participants are encouraged to present case studies with similar contexts and challenges which could support proposed ideas or schemes.

3.2.1 **List of Required Deliverables**

Participants are required to submit one hard copy of each of the following items:

1. **Executive Summary:** text up to 500 words
2. **Vision Statement:** text up to 1500 words.
3. **Three A1-size Panel Boards:** for graphic visualization of proposals and/or data, displayed in landscape orientation.

In addition, participants are required to include one hard copy of the following forms:

4. **Submittal Form:** filled with requested information (This form will be sent to the participants at a later stage).
5. **Participants Identification Form:** provided in a sealed envelope, as per the instructions below under Anonymity (Section 3.3.2)
(This form will be sent to the participants at a later stage).

And finally:

6. **CD-ROM:** including soft copy of items 1, 2, 3, and 4

3.2.2 **Further Detailed Instructions**

All texts could be in either English or Arabic.

The submitted entries should remain anonymous. No identification of any sort of the Participants is accepted to appear on any of the submitted documents.

Refer to Section 3.3.2 below for more information about anonymity rules and procedures to follow.

3.2.2.1 Executive Summary

Participants shall summarize in 500 words their submitted entries covering the three required components defined above. This text will serve to provide a quick briefing about the entry and will be used during the exhibition and publication.

3.2.2.2 Vision Statement

The purpose of the vision statement is to consolidate in 1500 words the principles and intentions addressing issues raised in the competition (*in this brief, the Reply to Questions document or any other document or information that were communicated by the Organizer as an addendum to this brief*).

The Vision Statement shall include the participant team's proposal structured by addressing the three main interrelated components mentioned above. In addition, it should present a clear institutional framework and implementation mechanism based on which the proposed vision and intervention solutions may be implemented (such as the legal framework and/or new public policies or updates of current ones).

Also it shall present a clear process for the implementation of the proposed advocacy strategy. Issues to be addressed, among others, are:

- The actors to involve.
- The impact in relation to the competition objectives: how did the proposed visions and intervention solutions achieve one or more of the competition objectives?

3.2.2.3 Three A1-size Panel Boards

Whether submitted in the form of a planning solution or in the form of a design intervention, entries must be presented, using graphic tools, on three (3) A1-size panel boards.

Panels should be mounted on lightweight foam core boards for display in landscape orientation, structured as follows:

- One A1-size panel to be used for the graphic display of the **General Vision** at overall level (three sites)
- Two A1-size panels for the graphic display of the **Intervention Strategies and Solutions** at selected site level.

As for the graphic display of the **Advocacy Strategy**, it may be incorporated in any/or all of the three panels at the discretion of each participant team.

For proposals with a planning intervention solution(s) at site level, participants are requested to include clear references to each law being used. For proposals with a design intervention, participants are encouraged to include plans/sections or any relevant drawings at a

scale adequate to clearly communicate the design idea and help the jury understand the details and special interventions of the proposed scheme. All drawings should indicate the North orientation. Scaled drawings must follow the metric scale. A graphic scale should appear on all scaled drawings. All plans and sections must be clearly labeled and referenced.

3.3 Terms and Conditions

3.3.1 Official Language

Participants may choose to submit their entries using either English or Arabic languages.

3.3.2 Anonymity

To ensure objectivity and impartiality, the submitted entries will remain anonymous. The procedure adopted by the Organizer to ensure anonymity of entries is based on those stipulated under Article 7 of the 'Guidelines of UIA Competition Guide for Design Competitions in Architecture and Related Fields, 2017', as follows:

"All competitors' designs shall be submitted and judged anonymously. It is essential that the anonymity of the competitors be maintained until the final adjudication has been terminated and, in the interest of the competition, rigorous measures should be taken to ensure that this principle is observed scrupulously. The competition regulations shall stipulate that all documents shall be submitted anonymously. The name, logo or any other mark that may identify the competitor, must not appear under any form. Anonymity shall be guaranteed by requiring each competitor to place an alphanumeric code of his/her own choice-composed of 4 digits + 2 letters, for example, 1 cm high on the upper right corner of each plan and accompanying document that constitute the entry, including the identification envelope (that will contain the identity and complete contact details of the competitor(s)). On receipt of entries, the Professional and Technical Advisor will be responsible for masking these codes with a serial number. The codes and corresponding serial numbers will be recorded in a register which will be kept in a safe until the jury has reached its final decision, selected the winners and signed the official report to the Promoter. The competitors' identification envelopes will also be placed in the safe until the results have been declared and anonymity lifted".

Failure to abide by the anonymity requirement will result in disqualification and exclusion from the competition.

3.3.3 Communication

Throughout the competition duration, all communication regarding the competition shall be carried out through the competition Coordinator on the following email: info@beyondcement.org. Phone calls will not be accepted. Participants shall under no circumstances contact or be contacted by other members of the Organizer team, jury members, or steering committee members throughout the competition period on issues related to the competition. Such attempt will result in the disqualification of the team's registration and entry.

3.3.4 Confidentiality

All participants are advised discretion during the length of the competition to ensure confidentiality of the proposals they will be developing and all data communicated to them.

3.3.5 Ownership of Entries

No submitted materials including executive summary, vision statement, panel boards, and CD-ROM will be returned to participants.

3.3.6 Authorship and Originality of Entries

Submitted entries shall be the original work of the participating team. Inauthentic, copied and/or plagiarized content shall result in the disqualification of the team.

3.3.7 Exhibition, Publication, and Promotion

By submitting their projects for the competition, teams acknowledge granting the Organizer the right to exhibit and publish their entries in full or in part in reports, books and advocacy material or exhibitions. In every case, full credit will be given to the authors of the published material.

3.3.8 Submission of Entries Deadline

Submissions received after the deadline specified under 3.1.7 above will be automatically disqualified.

3.3.9 Changes to the Competition

The Organizer reserves the right to alter, suspend or cancel the competition rules at any stage if that is deemed necessary for any reason outside of its control, in consultation with the competition steering committee members.

3.3.10 Handling of Deliverables

The Organizer will exercise due care with respect to all documents and materials submitted by the participants. The Organizer will not be responsible for any damage caused in the mail or by handling.

3.3.11 Indemnity Clause

Participants who enter this competition automatically agree to release the Organizer from any claims, losses, damages, expenses and liabilities resulting from their participation or any competition-related activities, including those inflicted by a third-party due to the participants' submission. Unless otherwise stated, the Organizer does not claim nor commits to implement the proposals put forth during the competition.

Appendices

In addition to the appendices referenced in the text above, The following includes other materials that participants are encouraged to go through as they provide important information relevant to the specific sites and the competition as a whole.

1 Maps

1.1 Master plans

- 1.1.1 Master Plans of Chekka and Heri - 2.2 - NA
- 1.1.2. A Master Plan of Badbhoun 2007 - 2.3 - NA
- 1.1.2. B Map of Badbhoun's Zoning according to Decision 18/2011 - 2.3 - NA
- 1.1.3 Master Plans of Koura's Middle Plain (Amioun, Bechmezzine, Bterram) - 2.4 - NA

1.2 Mapping

- 1.2.1 Previous land uses in and around the quarry - 2.3 - AR EN
- 1.2.2 Plot ownership in and around the Badbhoun Quarry - 2.3 - AR EN
- 1.2.3 Years of land acquisition in and around the Badbhoun quarry - 2.3 - AR EN
- 1.2.4 Chekka-Koura_Landmarks Landuse - intro - AR EN
- 1.2.5 General map of Current Zoning in Chekka and Surrounding towns of Koura - 2.3 and intro - AR EN
- 1.2.6 Seafront evolution 1956-2018 - 2.2 - NA
- 1.2.7 Comparing quarry sites to the master plan for quarrying and the NPMPLT - 2.3 AR EN
- 1.2.8 Land uses on the coast of Chekka and Heri - 2.2 - AR EN

- 1.2.9 Current land uses in Badbhoun - 2.3 - AR EN
- 1.2.10 Land uses in and around Koura's middle plain - 2.4 - AR EN
- 1.2.11 Spread of Badbhoun Quarry - 2.3 - AR
- 1.2.12 Spread of Kfarhazir Quarry - 2.3 - AR
- 1.2.13 Current Zoning Map in Chekka and Heri - 2.2 - AR
- 1.2.14 Current Zoning Map in Koura's Middle Plain - 2.4 – AR

1.3 Graphs

- 1.3.1 Quarries legislative process - 2.3 - AR EN
- 1.3.2 Mapping of Stakeholders in Koura's cement industry - 2.3 - AR
- 1.3.3 Timeline of the cement companies' expansion – 2.3 – AR

1.4 Base Maps

- 1.4.1 Sites Location Map – 1 - AR EN
- 1.4.2 Badbhoun Cadastral Map - 2.3 - NA
- 1.4.3 Barghoun Cadastral Maps - 2.3 - NA
- 1.4.4 Cadastral Map of Amioun (AutoCAD Format) - 2.4 - NA
- 1.4.5 Cadastral Map of Bechemzine (AutoCAD Format) - 2.4 - NA
- 1.4.6 Historical aerial_Koura_1956 - 2.1 - NA
- 1.4.7 Historical aerial_Koura_1962 - 2.1 - NA
- 1.4.8 Map of the Federation of Municipalities of Koura – 1.Intro - AR
- 1.4.9 Map of Cazas and Koura's towns - 2.1 - AR
- 1.4.10 Map of Soil Types in Koura's Middle Plain (1970) - 2.4 - NA
- 1.4.11 Map of the spread of Ain Al Tawous - 2.4 - NA
- 1.4.12 Map of the towns without Municipalities - 2.3 - AR
- 1.4.13 National Physical Master Plan for Lebanese Territories - 2.3 - FR
- 1.4.14 Satellite view seafront 1956 - 2.2 - NA
- 1.4.15 Satellite view seafront 1962 - 2.2 - NA
- 1.4.16 satellite_SiteA_2018 - 2.2 - NA
- 1.4.17 Badbhoun Aerial View 2017 - 2.3 - NA
- 1.4.18 Satellite _site C_2017- 2.4
- 1.4.19 Amioun Bechemzine Topographiacal Map 1960's
- 1.4.20 Amioun Bechemzine Geological Map 1960's
- 1.4.21 Cadastral map Chekka CAD
- 1.4.22 Cadastral map Heri CAD
- 1.4.23 General map sites A-B (Chekka/Heri- Badbhoun)
- 1.4.24 Topography map sites A-B (Chekka/Heri- Badbhoun) CAD

2 Synthesis

- 2.1 "Overview of the Number of Workers in Cement companies and the projects funded by the Companies in affected towns" - 2.2 - AR
- 2.2 Coast Case: Pollution and Health Overview - 2.2 - EN

- 2.3 Coast Case: Planning and Zoning Overview - 2.2 - EN
- 2.4 Livelihoods and the Job Market_AR - 2.2 – AR
- 2.5 The plains characteristics and types of plantations_2.4 - AR-EN

3 Articles

- 3.1 Koura's land: from fertile resource to raw material for cement factories – 2.3 - AR EN
- 3.2 Reading the Quarries Map in Lebanon – 2.3 - AR EN
- 3.3 The General Directorate of Urban Planning- Arbitrary Practice Between the National Master Plan, General Master Plans, Exceptions, and Decisions - 2.3 - EN AR
- 3.4 International Report about Cement Production in Lebanon (2016) - 2.2 - EN
- 3.5 Legal Agenda 58 Koura - 2.1 - AR
- 3.6 Civil Movements in Koura – 2.3 - AR
- 3.7 Chekka administratively divided from Koura: deadly or dying? - 2.1 - AR
- 3.8 How cement companies took over Koura's environment - 2.2 - AR
- 3.9 Heri beside Holcim, a sad story in a country that has abandoned its people - 2.2 – AR

4 Documents

- 4.1 "Response of Holcim to allegations of violating Lebanon's Law No. 444 – Environmental Protection (2017)" - 2.2 - EN
- 4.2 Cimenterie nationale current and future production - 2.3 - EN
- 4.3 MoE_draft of national policy for quarrying 2019 - 2.3 - AR
- 4.4 "State Council Review concerning Badbhoun No. 348:2015-2016 Cimenterie Nationale vs HCUP" – 2.3 - AR
- 4.5 Archival Poster Plain - 2.4 - AR
- 4.6 Archival Poster Zakroun - 2.3 - AR
- 4.7 Decree and master plan for quarries 2009 - 2.3 - AR
- 4.8 Laws - 4.Appendices - AR
- 4.9 MoA_National Agriculture policy (2015-2019) - 2.4 - AR EN
- 4.10 Environment Protection Law244662 - 2.2 - AR
- 4.11 Cooperatives law - 2.4 – AR
- 4.12 The North Lebanon Project NOLEP - 2.4 - AR

5 Studies

- 5.1 "Health Impact of Airborne Particulate Matter in Northern Lebanon: From a Pilot epidemiological study to physio-chemical characterization and toxicological effects assessment (2017)" - 4.Appendices - EN
- 5.2 Technical Report about Air Pollution in Chekka and Surroundings -

appointed by the Public Prosecution Office in North Lebanon (2002). -

4.Appendices - AR

- 5.3 "Air Quality and Health Impact of Cement Industry on Urbanized Rural Areas - Study by LAU Professors Gebran Karam and Mazen Tabbara" - 4.Appendices - EN
- 5.4 "A Study of the Inorganic Chemical Composition of Atmospheric Particulate Matter in the Region of Chekka, North Lebanon (2009)" 4.Appendices - EN
- 5.5 "Mesotheliomas in Lebanon: Witnessing a change in Epidemiology - (A Study associating Mesotheliomas to Asbestos in Chekka)" - 4.Appendices - EN
- 5.6 "Selaata: Impact of Phosphogypsum and Other Factory Effluents on Meiofauna Communities of Batroun Coastal Region (2008)" - 4.Appendices - EN
- 5.7 "Assessment of Abandoned quarries for revegetation and water harvesting in Lebanon" - 2.3 - EN
- 5.8 Environmental Impacts of Quarries on natural resources in Lebanon - 2.3 - EN
- 5.9 Average annual pluviometry for Lebanon 2012 - 2.4 - FR
- 5.10 Using Fiscal Instruments to Control Quarry Proliferation - 2.3 – EN
- 5.11 Household income and expenditure in Koura 1953 - 2.4 - EN

6 Books

- 6.1 References - 2.4 - AR EN

7 Photos

- 7.1 Seafront photos - 2.2 - NA
- 7.2 Badbhoun quarry photos - 2.3 - NA
- 7.3 Koura middle plain photos - 2.4 - NA
- 7.4 Panorama Chekka Heri and Collar Towns - 2.1 - NA

8 Jury Agreement - 3.1 - AR-EN