Investigating Geospatial Social Capital Networks for Industry-based Grassroot Economies:The Case of Damietta, Egypt

Nourhan Heysham

School of Science, Engineering and Environment

University of Salford, U.K.

Doctorate of Philosophy in The Built Environment

Doctoral Thesis Submission

2022

Dedication

I dedicate this work to my loving family.

To my father : You are with me every step of the way and will always be.

To my mother and sister : You have been there through it all, thick and thin, and I'm eternally grateful. I hope I make you proud.

Acknowledgement

This journey has been quite a challenging one (with a happy ending!), and I have been fortunate enough to have many people to thank for the support and positive influence through it all.

I can only start by extending my sincere gratitude to Professor Hisham Elkadi, not only for supervising this work, but for believing in my potential as a researcher, and nurturing it through continuous guidance, support, and mentorship. I am a far better researcher (and much stronger person) than the one who started this journey four years ago. I will continue to aim to meet your expectations of my potential in the upcoming chapters in my life.

I would also like to thank my co-supervisor, Dr Sara Biscaya, for the guidance and most of all for being an approachable teacher and kind supporter in times of need. Dr Sara's compassionate guidance of her students and colleagues is truly inspiring.

This work (and any other milestones in my life) I have only achieved through the continuous love and support provided by my mother and sister. I'm grateful to having them in my life no matter how far and restricted the world has become. I hope we keep supporting each other through barriers and celebrate successes come what may.

I am also extremely grateful for the friends I've made and friends I kept, whose advice and support through multiple milestones have been unparalleled. This brief note would not do all my friends justice, but I will try to name just a few. I'm grateful that this journey has brought Dr Inji Kenawy in my life as a friend, wise advisor, and kind supporter. I'm also grateful for Dr Sana Belguith who provided a strong push in the right direction with no holding back. Yahya Gamal (Dr soon); my dearest friend and great supporter through thick and thin.

Last but definitely not least, Dr Alex Martinez Cesena, not only for proofreading this 300-page document, but for providing the support even when I claimed I didn't need it. I look forward to sharing many more chapters and milestones together.

Table of Contents

List of Figures

List of Tables

ABSTRACT

Social capital is a vital asset that contributes to the development of professions as well as communities, specifically in small scale urban settings with a dense social structure. This research aims to develop new tools linking social capital to spatial interactions to fully understand the value of the grassroot economy of the furniture industry in Damietta. Furniture enterprises (MSMEs) in this context form the main economic base of the city socially inherited through generations. The research examines the hypothesis of social capital being the main success factor of this economic cluster, building on Porter's Competitive Advantage theory and Putnam's social capital theory, linking networking, trust and norms to the spatial distribution of furniture enterprises in the city (Network Theory).

In light of recent globalisation-oriented development in Damietta, the city's existing coherent urban and social complex patterns are compromised. Quantifying a generally qualitative measure such as social capital provides data-driven commendations for community-oriented decision-making towards small scale contextual sustainable development.

The proposed methodology adopts a mixed methods approach, starting with interviews that verify the theoretical and spatial framework, and geospatial GIS network mapping based on field survey. The research utilises Network Theory and geolocation data to quantify social capital and visualise its magnitude in relation to space. The output is a novel tool that is the theoretical and spatial framework, and the production of a novel dataset of spatial interactions of social capital network mapping that would inform data-driven development in Damietta. The approach and developed tool can be appropriated to other industries and urban settings that resemble similar industrial characteristics to Damietta.

This work concludes that social capital is highly abundant among the network of furniture enterprises (MSMEs) in Damietta, which has enriched the patterns and dynamics of the industry in the city. There is a unique way in which the industry operates in Damietta considering the vernacularly formulated social capital networks, and socio-spatial interactions and supply chain variations that have developed in the city. This has created an inclusive, local and more resilient industrial cluster that is in need of both conservation and growth.

<u>Key words:</u>
Grassroot Economies, Economic Cluster, Furniture Industry, MSMEs, Network Geospatial Mapping.

Thesis Supplementary Information

Acronyms

CNC	Computer Numerical Control (machines)
CWWFI	Chamber of Woodworking and Furniture Industry
DFC	Damietta Furniture City
GDP	Gross Domestic Product
GHE	Green House Effect
ICLS	International Conference of Labour Statisticians
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classification of All Economic Activities
ITC	International Trade Centre
MSMEs	Micro Small and Medium-sized Enterprises
NVA	Net Value Added
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SMEs	Small and Medium-sized Enterprises
UN-CDP	United Nations Committee for Development Policy Working
UNDESA	United Nations Department of Economic and Social Affairs
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
UNISDR	United Nations International Strategy for Disaster Reduction

Glossary

Social Network – a network of friends, colleagues, and other personal contacts. This could be digital or offline networks (Dictionary, 2021).

Social Capital – the interpersonal relationships, institutions, and other social assets of a society or group that can be used to gain advantage (Dictionary, 2021).

Competitive Advantage – Competitive Advantage can be described as the ability to achieve superiority relative to other competitors in the same field or industry (Porter, 1990,Qiu, Cano-Kollmann, and Mudambi, 2017). In practice, the competitive advantage of an entity relates directly to business strategy and resources, which can be either tangible or intangible (Qiu et al., 2017).

Cluster – Porter's clusters can be defined as "geographic concentrations of companies, suppliers, related industries, and specialised institutions" (Magretta, 2012). Examples vary from Silicon Valley (technology) to Diamond cutting in Seurat, India. Clusters play a significant role in competition as a booster or catalyst of individual companies' productivity. Clusters also inspire efficiency through

geographical proximity of effective local suppliers and services, drawing on local assets and institutions such as physical infrastructure and clean water among others. Clustering is undoubtedly a predominant feature of successful and growing economies, driving competitiveness, entrepreneurship and new business growth (Magretta, 2012).

Enterprise – Any unit engaged in the production of goods or services for sale or barter" (International Labour Organization, 2016; International Labour Organization (ILO), 1993).

Trust / Trustworthiness – the capacity to commit oneself to fulfilling the legitimate expectations of others, is both the constitutive virtue of, and the key causal precondition for the existence of any society" (Dunn, 1984,Misztal, 1996).

Norms - a set of standards, models, or patterns. Within a community context, it would be agreed standards that community members adhere by and are held up to (Dictionary, 2021).

Node – a data point (could be a person, and enterprise, location… etc.) within the network structure, as defined by its relationship to another data point. The relationship between two nodes is a **tie** (Dictionary, 2021).

Tie – In the context of networks; the bond or connection between individuals in the community (Dictionary, 2021).

Grassroots – the common or ordinary people, especially as contrasted with the leadership or elite of a political party, social organization, etc., the rank and file (Dictionary, 2021).

Oyma (Carving) – is a specific type of furniture design and carving specific to neo-classical designs. This is a prevalent type of pattern in Damietta, where carvers (oymagy/oymageya) create the design as 3D physical samples (rather than 2D computer aided designs) that can be shown to clients and can be used by other workshops or factories to create the product. It is a local craft and part of the unique aspects in the industry in Damietta (source: interviews analysis in this research).

Sustainable Development Goals

The outputs of this work contributes to addressing the Sustainable Development Goals (SDGs) (United Nations, 2021) for Egypt through tackling the socio-economic and urban development of Damietta's Furniture Industry and exploring relevant opportunities and challenges. This is expanded upon in Chapter 7 below. The SDGs investigated in this research are:

- SDG 4 – Quality Education.
- SDG 5 – Gender Equality.
- SDG 8 – Decent Work and Economic Growth.
- SDG 9 – Industry, Innovation and Infrastructure.
- SDG 11– Sustainable cities and communities.
- SDG 12 – Responsible Consumption and Production.
- SDG 16 – Peace, Justice and Strong Institutions.
- SDG 17 – Partnerships for the Goals.

Publications and Further Research

This is a list of publications, conferences, presentations, and research projects that were done on this research topic in parallel to the development of this thesis.

Funded Projects

AHRC-funded Climate Emergency Fund – "Conservation of Climate Change Endangered Cultural Furniture Industry Heritage in Damietta, Egypt - CHIDE" – PI: Prof Hisham Elkadi – £150k – 2020.

Articles

Heysham, N, Elkadi, H and Biscaya, S (2021) 'Exploring Social capital within Damietta's furniture industry value chain as mode of community currency' International Journal of Community Currency Research Volume 25 (Issue 1) 52-67; http://www.ijccr.net; ISSN 1325-9547; DOI http://dx.doi.org/10.15133/j.ijccr.2021.004

Conference Papers and Presentations

Heysham, N. & Elkadi, H. (2021). Mapping Social Capital Networks of Furniture Industry - Resilience to Climate Emergency In Damietta City, Egypt. AMPS - Cities in a Changing World: Questions of Culture, Climate and Design – CUNY – NY, USA.

Heysham, N., Elkadi, H., & Biscaya, S. (2020). Investigating The Effect of Social Capital on The Resilience of Furniture Industry Grassroot Economies in Damietta, Egypt. ICPCR-20 Conference – MSA, Cairo, Egypt.

Heysham, N., Elkadi, H., & Biscaya, S. (2019). Investigating Social Capital of Furniture Industry Grassroot Economies In Damietta, Egypt. SPACE International Conference on City Planning & Urban Design. London, UK.

Heysham, N., & Elkadi, H. (2019). Social Capital As A Community Currency For Furniture Industry Enterprises In Damietta, Egypt. 5th Biennial RAMICS International Congress – Takayama, Japan.

Abdel-Rahman, N., "Investigating Social Capital for Grassroot Economies in Damietta Egypt", Poster Presentation, @MethodsManchester Conference, University of Manchester, 2018.

Other Presentations/Events

The Manchester ESCR Festival of Social Science 2021 – Presentation to Social Science researcher in Greater Manchester – planned for November 2021.

1

PART 1: INTRODUCTION

CHAPTER 1 - INTRODUCTION TO RESEARCH

1.1. Introduction: Networks, Marginalization and Fundamentalist Economies

> *"We will only be able to understand what is going on in the social world if we understand the social structures that have given rise to the phenomena that we are trying to understand"*
>
> *Bhaskar (2011)*

The dynamics of how people and their economies interact and evolve formulates space and the environment around them. Since these dynamics occur as a result of interaction between actors (Coleman, 1990), understanding the networks related to people and the economy becomes crucial for urban development. However, social systems manifest uniquely within each context as culture, lifestyle and many other variables come into play. The type of economy and how people relate to it is also a significant variable to interpret a given context with its potentials and challenges.

Within a majorly capitalistic globe, some fundamentalist economies still survive under different names and umbrellas; local economies, grassroot economies and even informal economies. These patterns of activities -although quite different in nature- all exhibit values distinctive from the given capitalist approach. Society and norms form a large influence on the evolution of small-scale economies. Although these economies are small in unit size, their contribution to the market is far from small. For example, economies described as "informal"

in nature have been proven to contribute to the city's GDP by figures that range from 20% to 60% in "poorer" developing countries (Restrepo-Echavarria, 2011). This also stirs up a conversation on the economies that are politically "visible" and acceptable, which inherently includes consideration within development plans. Examples of governance plans that marginalise local economies and prioritises capitalist investments over developing the society as a whole are not few within literature and in reality -especially in Global South contexts-, which results in many local economic potentials being jeopardised and/or wasted in the face of mega-scale investment. In this context, the socially and economically marginalized portion of the community are usually side-lined from the approaches taken by decisionmakers regarding urban development.

These concepts and interweaving ideas between urban economy, social structures, power relations form the core of this research, where the researcher explores a specific case of industry-based cities and identifies the complexities that operate simultaneously within a dynamic industrial urban setting. A specific case study (Damietta Egypt) is explored where a certain industry/craft (furniture industry) is embedded in the culture and livelihoods of the community, where most of the economic activities are directly or indirectly related to this industry and passed down from one generation to the next. In such a dynamic, the small scale of the economic interactions form a strong "cluster" (Porter, 1990) that functions and evolves within its context according to the possibilities and challenges. As this research explores Damietta's urban context with its local scale (grassroots) and industry-based (Damietta) economies, new potentials for alternative data-driven development arise based on untangling the complex relationships between social capital networks and the urban/spatial patterns in in the city and industry. This chapter below illustrates in depth the rationale behind this particular choice of research topic and approach, as well as the theories, concepts, methods that the research utilised to contribute to the formulated research aim and question.

1.2. Research Aim

In developing countries such as Egypt, a wide portion of industry is characterised as being at grassroots scale, in condensed clusters, as well as powerful in productivity and skill. <u>This research aims to develop new tools linking social capital to spatial interactions to fully understand the value of grassroot economy of the furniture industry in Damietta.</u>

1.3. Research Objectives

To achieve this aim, the following objectives are proposed:

- Survey and document the supply chain for furniture industry grassroot economies in Damietta city.
- Develop a theoretical and spatial mapping framework to quantify the extent of complexity of Furniture Industry in Damietta (physical, urban and social).
- Geospatially map social capital Networks of furniture industry in Damietta.
- Propose policy recommendations for the conservation and economic development in Damietta based on social capital related local identity of furniture industry.

1.4. Research Question

<u>How are the dynamics of social capital and spatial distribution in Damietta's furniture industry MSMEs contributing to the success of the industry? And how can this be utilised as an asset to develop Damietta into a sustainable local industrial economy?</u>

The research poses a combined research inquiry, which includes mixed **exploratory and evaluative doctrines of research** (Creswell and Poth, 2018, Saunders, Lewis, and Thornhill, 2016). The study explores the dimensions and value of social capital within grassroot furniture industry in Damietta, as a quantitative measure of variables of social capital.

1.4.1. Scientific Queries

Concerning the main research question, queries arise consequently, which are:

- What is the supply chain of grassroot furniture industry in Damietta, and how are they integrated within the city's spatial urban dynamics?
- What are the variables of social capital, how do they apply in Damietta's furniture industry?
- How can grassroot furniture industry dynamics be geo-mapped in Damietta city?
- How does spatially based social capital in Damietta lead to economic prosperity and sustainable success of the city's furniture industry?
- What are the recommended measures that could stir the evolution of the furniture industry economy in Damietta to allow for data driven sustainable development in the city?

1.5.   Research Rationale and Justification

The rationale behind this research can be explained as an overlap between complex factors that together form the unique situation of Damietta city today. Primarily the strong interlinked grassroot economies of furniture industry embedded in the city's social structure for almost a century, along with the need for an economic development model that understands and builds upon the existing tangible and intangible resources of the city of Damietta. However, recent ongoing national development strategy is creating largescale capitalistic foreign investment in the same area which raises questions on local economies, social capital and sustainable economies. Other inquiries of issues of visibility - or lack thereof- of grassroot economies as well as prioritisation of state over community stakes come to light in this case. Further analysis of each of the stated issues is presented in the subsections below.

1.5.1. Why Damietta?

The rationale behind pinpointing Damietta as the single case study to be examined in this research was based on the intertwined layered nature of this

small Mediterranean city, based on the multifaceted complexity of the interactions between its people, their activities and space. This adds to the challenges that the city faces, which emphasise the significance of the research approach and aim of this work.

The first pragmatic layer is that Damietta is a clear representation of semi-rural industrial cities in the context of developing country economies. Similar to Sassuolo Italy (section 3.5.1), Damietta has evolved from craft to the next over the past multiple centuries (AlShayal, 2000), making its way into modern industry based on the accumulated knowledge of generations of its residents and families (section 5.2). From this notion, another layer of complexity is that Damietta's industry did not evolve as a development plan, but rather vernacularly through decades of SMEs rooted in the city and inherited through generations. Hance, Damietta can be identified as a place of "cultural industry" (section 3.4), where there is a tight link between space and "cultural production" (Allen John. Scott, 2008). Damietta's production system, social structure and spatial planning all advance hand-in-hand to form a vernacular and economically distinguished industrial hub that is weaved within the livelihoods of its residents.

Another layer that distinguishes Damietta is that its scale and approach to economic growth is highly based on ecolocalism, which is an economic concept that focuses on creating local and regional self -reliant community economies, capitalising on the importance of social capital to preserve natural capital (Curtis, 2003) (section 3.3.2). This presents opportunities through examining Damietta city to identify development routes that is people-centric and almost contrary to the traditional capitalistic approach. With the furniture industry accounting for 2.1% of total production in Egypt (ILO, 2016), the impact of investigating and developing Damietta would ensure local, regional and national recommendations for growth through this research.

Considering the abovementioned unique characteristics of Damietta, the city still faces multiple threats in the modern day, both natural and economic. In terms of location, Damietta is at risk of seal level rise (section 1.5.5), and its industry's social capital network could be jeopardised in the following 50-100 years (El-Raey, 2010,IPCC, 2014). This adds to economic and political stresses that the local SMEs face in Damietta, where a new mega project with external investment is currently overtaking the market in the region and nationally (section 1.5.6).

The unique complexities in the cities, paired with the opportunities for development and challenges Damietta faces, all formulate a strong case for choosing Damietta as the singular case study to be investigated in this research. Untangling these layers of urban, social, political and spatial patterns would allow for data-driven recommendation to development from this work. With the National significance of Damietta as a national furniture industry hub, the impact of this work would extend to future research and policy influence towards the preservation and progress of the city's industry and community.

1.5.2. Damietta's Strong Industry = Strong Social Capital Network

Similar to industry-based cities around the world, observations of Damietta's strength in industry go hand in hand with a strong social structure of trust, networking and norms between enterprise owners and workers, which are in theory the main constituents of a strong "Social Capital Network" (*Coleman, 1990*). Unlike other industrial networks, Damietta's furniture community operates on a grassroots scale, where micro, small and medium sized enterprises (MSMEs) in the furniture industry represent 99% of the total number of enterprises, with about 95% being micro businesses (less than 5 employees) (ILO, 2016). These factors, in addition to the compact spatial distribution of the city and its infrastructure, formulate *a unique case where the industry's resilience and success is tied to the existing long-term social capital network that is emphasised by the small scale and tight connections between actors*. This distinct socio-economic pattern in Damietta is under risk of being replaced by

capitalist mega projects (section 1.5.6), as well as the environmental risk of sea level risk (section 1.5.5). In light of this risk, exploring this interlinked relationship between the different factors affecting Damietta, its actors and its economy to find alternatives for sustainable user-focused development becomes the main focus and rationale behind this research.

1.5.3. (In)visibility of Grassroot economies

Local economies effectively contribute to city scale GDP as well as national GDP in both developed and developing countries (Horodnic et al., 2018). Even though this evidence points towards the importance of inclusion of those local economies in the scope of the city's economic development, grassroot economies in many developing countries are deemed invisible to the municipalities and policymakers (Ruzek, 2015), if not considered as a 'syndrome' that needs to be altered in nature to be incorporated. For example, in the case of Damietta presented in this research, the development plans of the government are completely neglecting the old city's existing micro, small and medium enterprises (MSMEs) and placing all the funds into a new mega project that hinders the grassroot enterprises helpless in the face of major foreign investors (further discussion of the case is presented in section 1.5.6).

Contrasting to conventional municipal perspective, Ruzek (2015) suggests that embracing local economies can allow for more sustainable economies. Research in economic sustainability argues that local economies offer an alternative way to capitalism and can shift the global focus from a globalized capitalist society to eco-localism. Literature supporting the notion of an inclusive economy, or as defined by Gibson-Graham as the diverse economy, highlights the importance of acknowledging that more than half of the economies in both rich and poor countries are non-capitalist in nature (Gibson-Graham, 2006).

1.5.4. Industry-based Cities and Their Economy

This research focuses on the specific context of craft industry-based cities, given a case study of a culturally oriented industry (furniture making). In the past few decades, there has been a shift in the relationship between cultural expression and the city, where the former is seen as a principal driver of urban economy (Bianchini and Parkinson, 1993,Newman and Smith, 2000). In this sense, modes of cultural expression relevant to economic gain have been identified as a quality of the city that allows it to compete within a globalised economy (Scott, 1997). This is especially prevalent in the context of craft-based industries as within this setting, cultural production is closely related to economic gain through craft-related activities.

In the beginnings of the 19th century, coinciding with the industrial revolution's affected the economic development of cities through the rapid increase in consumption and production (Mohajan, 2019), various crafts in cities around the globe developed industry-related economies (Allen John. Scott, 2008). During this period, the given craft/industry would be the main economic base of the city with most of the population's employment and businesses relating to it whether directly or indirectly. The industry is weaved into the social and physical structure of the city. Such examples of industry-based growth in cities had emerged in both developed and developing countries (e.g. Los Angeles (USA), Sassuolo (Italy) and Damietta (Egypt)). However, in the context of developing countries, the businesses have been passed down through generations during the 19th and 20th centuries, with no or little formal introduction into the modern legislative and taxation systems. Modern legislation is slowly becoming more defined and established in this context. In this sense, the local economies as they stand today in a city like Damietta are a reflection of these overlaid global, national and local developments. This unlocks issues of prioritization of grassroot economies in light of their contribution to employment and city identity, as well as issues of social integration and synergy within the different economic activities of the city.

1.5.5. Vulnerability to Sea Level Rise – Egypt, Delta and Damietta

The implications of global warming and climate change processes form an unparalleled threat to the global community. An estimate of 0.13 degree global warming per decade is estimated as a result of the increase of concentration of greenhouse gases, as well as temperature increase projections that range between 1.1 and 6.4 degrees by the end of this century (El-Raey, 2010,IPCC, 2014). These correspond to an increase in sea level rise, which ranges from a mild 18cm projection to more sceptical scenarios of more than 2m rise by the end of the 21st century (El-Raey, 2010). This is not including the correlation between climate change and the frequency and severity of natural hazards in countless spots around the globe. An increase in the number of hazardous events over the last few decades has been noted by major insurance companies as well as various studies (Banholzer, Kossin, and Donner, 2014,Rosenthal and Rauch, 2013).

Various studies have illustrated the vulnerability of Egypt as a nation to sea level rise. According to Dasgupta et al. (*2009*), Egypt is the most affected GDP amongst the North African nations by sea level rise. El-Raey *(2010)* also indicates that the highest population at risk due to sea level rise is Egypt, with a figure between 5 to 12 million inhabitants at risk. Climate change impacts in Egypt are most prevalent in north coastal zones overlooking the Mediterranean sea since this zone, first; is most vulnerable to sea level rise; and second exhibits the most damage to water, agriculture and tourism in urban agglomerations (El-Raey, 1997). Lowest land elevation on the north coast is the Nile Delta area, which extends for 250 km, along which lay multiple cities with high populations such as Alexandria, Port-Said, Rosetta and Damietta. Each of those cities encompasses a significant share of the Egyptian industrial and economic sectors, in addition to the high fertility of the Nile Delta's low lands (El-Raey, 1997).

Table 1-1 - Population figures and growth rates for Cairo, Alexandria and Damietta (CAMPAS, 2017).

City	City Population (thousands)	City Urban Population	
	2016	Urban Population (Thousands) 2016	Urban Population (%)
Cairo	19128*	19128*	100
Alexandria	4986	4985	98.2
Damietta	1360	545	39.4

* (United Nations, 2016).

Egypt is a developing country with an expanding population approaching 100 million in 2018 (CAMPAS, 2017). The highly multifaceted socioeconomic landscape in Egypt has been framed and reframed various times in this developing country's modern history. The fluctuations in the political and economic policy strategies over the past century have had vast effects on the type, size and nature of economic activities that more than half of the population adopt, the informal economy. The major shift has been a result of the political shift between monarchy of the royal family of Mohamed Aly Pacha to a centrally-planned socialist state (Elshamy, 2015) in the 1950s. Although the informal economies in the beginning of the 20th century were a reflection of a highly agricultural nature among other factors, the centrality of the socialist state has been followed by the initiation of the economic liberalisation in 1973 (famous era of "open economy" in Egypt, which translates to "infitah") marked a new stage where privatised economic activities could be effortlessly 'masked' (Roy, 1992).

For Damietta city, its location on the verge of the Mediterranean and the Nile River, as well as overlooking Manzala Lake to the east and Damietta port to the west has placed it in a quite disagreeable setting with relation to sea level rise.

Figure 1-1 - Google Satellite Imagery of Damietta (Google Maps, 2019)
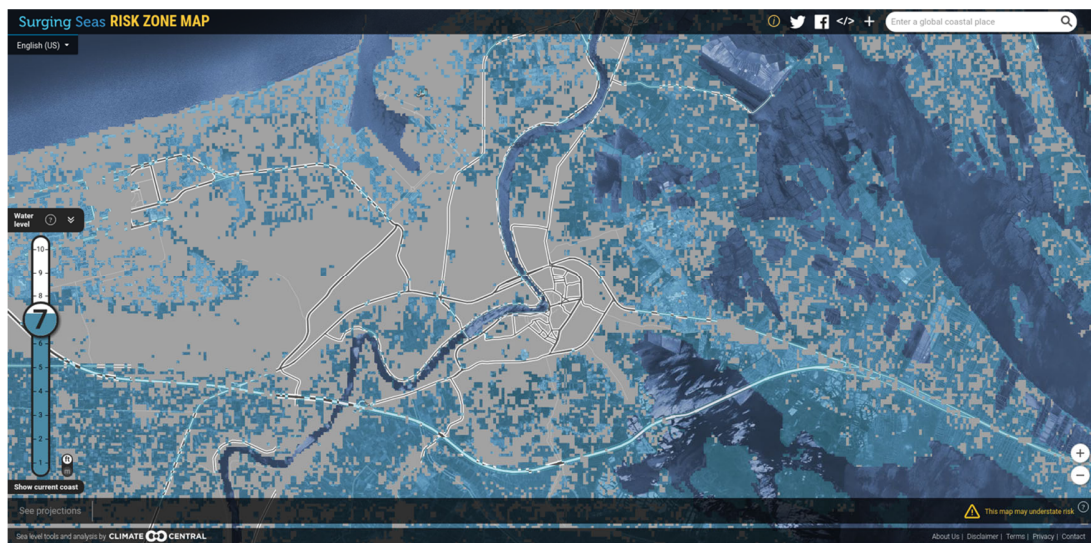
Figure 1-2 - Simulation of 2m Sea Level Rise scenario (Climate Central, 2018).

The highest lands are those on which the old city is situated (by the Nile River), whereas elevation starts decreasing as the distance from the city centre increases. In this controversial situation, horizontal expansion of the city is quite unfavourable, especially with agricultural lands surrounding the old city and the small surrounding towns on the Nile. The maps in Figure 1-1 and Figure 1-2

show the city's location, and a simulation of its high vulnerability to sea level rise. These particular circumstances imply discussions on whether investing in existing structures and economies would be a more environmentally adequate approach given the strong existing limitations of the sea, Nile River and low elevation agricultural land.

1.5.6. Controversial National Development approach in Damietta

The current political landscape in Egypt is enforcing a national economic direction of creating new mega projects in different areas. Examples are the new Administrative Capital east of Cairo, as well as new cities such as New Alameen and New Damietta (which are independent cities adjacent to the old city fabric but disconnected from it). This direction can be challenged as the "old" urban and economic infrastructure of the nation is put out of focus for the sake of new projects, leading to questionable rational of the development agenda.

Regarding Damietta's development, the government's new mega project (DFC) commenced in 2014 and launched in 2019 (Mohamed Elgali et al., 2019) is focused on furniture industries with international funding and foreign investment and stated to be situated outside the boarders of the old city as a purposeful encouragement of the already existing furniture industry in the city. Although the publicised campaign of the project states a strong and well-defined path for economic prosperity, examining the facts closely proves otherwise. According to the sea level rise map below, not only is the whole region subject to sea level rise, but more specifically DFC site lies completely on land of elevation zero and +1m at most, leaving the whole plot vulnerable to sea level rise by the year 2080 (or 2100 at best). Given the magnitude of the investment in this project, it would be rather controversial to execute it on a plot that is expected to be submerged within 50 years' time.

From a socioeconomic perspective, Damietta's economic nature has been always associated with the entrepreneurial essence of its furniture industry. It is

a unique context where cluster economies (similar to Sassuolo, Italy) have evolved through decades and has been passed down from one generation to the next. Such a mega project outside the city would be drawing out not only the employment pool in the city, but also the income and local investment. Instead of developing the city's economy, the project –in its current form- is offering an autonomous industrial base where Damietta's population shifts to be worker-based rather than owners and entrepreneurs.
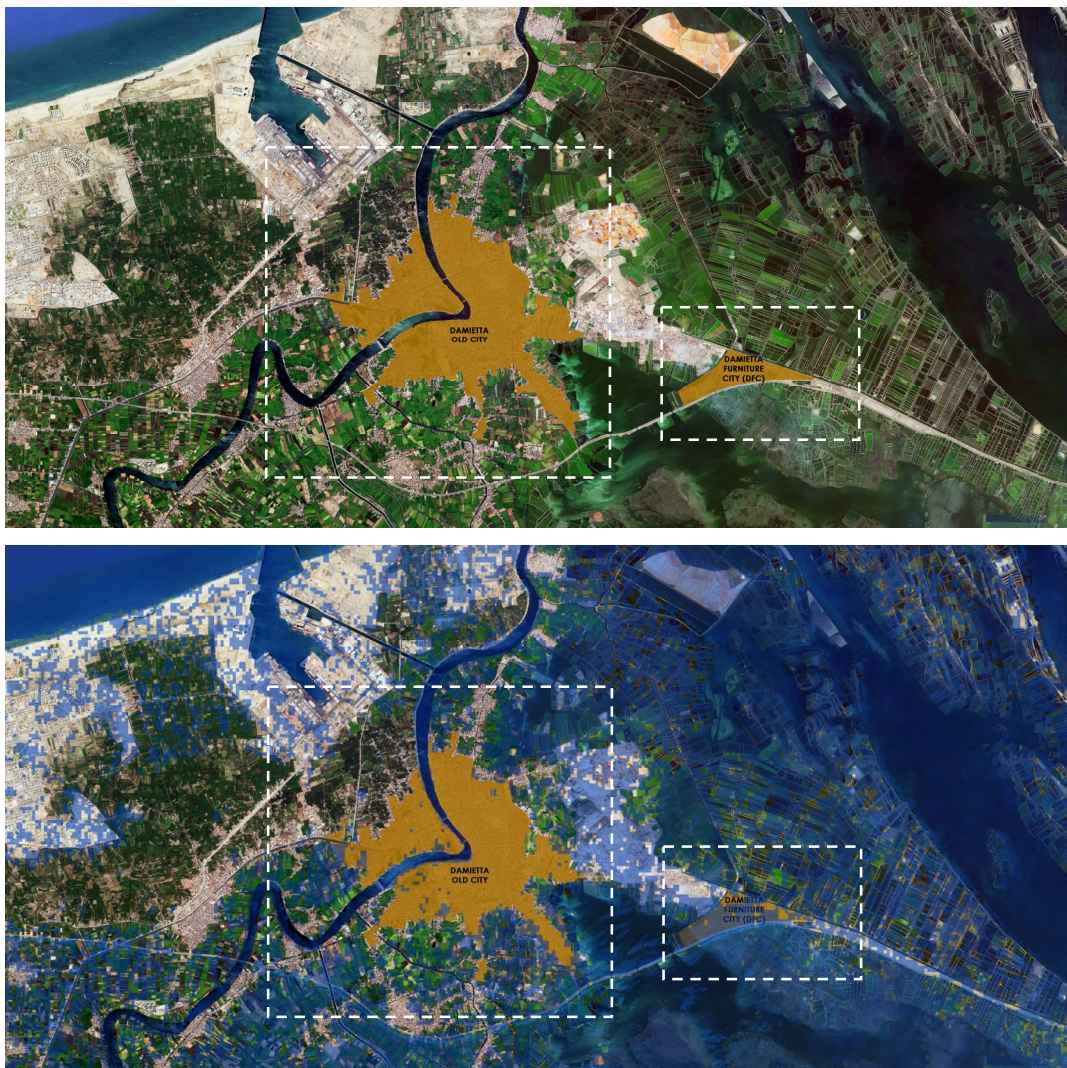
Figure 1-3 - 2m Sea Level Rise scenario and its effect on the old city and the DFC megaproject (Climate Central, 2018).

1.6. Research Hypothesis

This research draws connections between social capital components, community structure and spatial proximity. The main hypothesis is that social capital is correlated with the spatial distribution of small-scale grassroot economies in Damietta (MSMEs). Enterprises with higher connectedness in terms of trust, network and norms (Putnam et al., 1993) are expected to be spatially proximal to one another and to exhibit higher "control" (Lin, 2001) in the market. In relation to community structure, its definition –open or closed– (Wallman et al., 2018) is also a reflection of the nature of the dimensions of social capital. The research predicts that a closed community –with higher bonds but not bridges or links– (Gittell and Vidal, 1998,Hunt, Durham, and Menke, 2015,Szreter, 2002,Szreter and Woolcock, 2004) would have a negative drawback on the status of the industry in the city (Wallman et al., 2018). Contrastingly, the more open the community in Damietta could be, the higher profits and better chance for development of the collective innovation in the industry (Wallman et al., 2018). Thirdly, in relation to the spatial aspect, the effect of physical proximity on enterprise profits is another assumption in this research, within the setting of an economic cluster (Porter, 1990). Whether proximity and physical accessibility to workshops are separate and significant factors in the calculation of social capital is to be explored in this research.

1.7. Research Gap

The factors shaping the case of Damietta city form a unique context that is binding yet hold capacity for both theoretical and practical innovation. Although social capital has been developed through the work of various theorists over the years (Bourdieu, 1986,Burt, 1992, 2015,Coleman, 1988, 1990,Hunt et al., 2015,Lin, 2001, 2003,Putnam, 2002a,Putnam et al., 1993), its relation to the spatial aspect of the city in terms of data analytics remains unchartered waters. The main body of literature examines social capital as a qualitative measure which does not relate to the spatial dimension of the city.

Grassroot economies is an approach that emerged from real-life implementation research introduced by Ruddick (Dissaux and Ruddick, 2017,Ruddick, 2015,Ruddick, Richards, and Bendell, 2015) within the past decade years. The field's interdisciplinarity with other established theories and bodies of literature is yet to be explored in research. Within this research work, the interdisciplinarity of the concept of grassroot economies with social capital Theory, Porter's Competitive Advantage Theory and spatial distribution of economies is presented and utilised in the design of tools for mapping the industry in the case study Damietta.

In the context of developing countries, economic research suggests that statistics of MSMEs are specifically significant to understand the labour market, where the unemployment rate as well as indirect methods of estimation fail to provide precise data (International Labour Organization, 2013). There is a prevalent deficiency concerning the tools for quantifying such measurements for industry-based economies in Egypt, as well as complete lack of social capital statistics data, which is not adopted as part of the national census. This signifies the importance of the empirical part of this research, which includes creating a dataset for social capital for MSMEs in Damietta.

1.8. Research Impact / Significance

Within social capital research, the overlap of complex issues formulates unique perspectives through which communities adapt and coexist. For Damietta, the strong interlinked grassroot economy of the furniture industry has been embedded in the city's social structure for decades, along with the need for an economic development model that understands and builds upon the existing tangible and intangible resources of the city. Nationally however, recent development strategies in Egypt include building a mega project for furniture industry on the boarder of Damietta city, which raises questions on the future of the local economies. This setting provides for a significant research intervention

that sheds light on social capital as a defining factor that has developed the nationally well-known reputation of Damietta's furniture products for years. Issues that arise include the visibility -of lack thereof- of grassroot economies in comparison to globalised economies, and whether either direction of development alone is optimal for social and economic stability of the community.

Quantitative data that frame the potentials of the old city's spatial distribution and social networks in an economic perspective is expected to have a vital effect on how decision makers are tackling development strategies regarding Damietta. The researcher also aims to advocate the results to the local community of Damietta as well as the Chamber for Wood Industry in an attempt to promote local growth and the sense of belonging to Damietta as an economic cluster with room for development and connections to the global market. This should be done through meetings and local seminars in collaboration with the later Chamber, which already holds a role in reaching out to workshop owners.

Within the exploratory interviews, the research attempts to understand the socio-economic bonds between individuals working in the industry in Damietta, and the spatial patterns that aid the balance of this community's lifestyle in a semi-rural context. The researcher aims to capture elements of intangible values related to social capital as well as the tangible aspects through the mapping fieldwork.

The research in its entirety offers theoretical as well as empirical impact. This is through providing a clear theoretical and spatial framework that examines the relationship between social capital, economic activity and spatial distribution for an economic cluster (Porterian concept – further details explored in theoretical correlations in 1.9) in a visual locative approach. This is also achieved through providing a novel geospatial dataset for furniture industry MSMEs in Damietta, which is a currently non-existent scope for industries in Egypt. Taking Damietta as a precedent in research, the adopted methodology in this research can be

implemented for other contexts and local industry hubs in Egypt, opening the horizon for positive change and conservation of at-risk local economies. The impact of the approach can also extend to other similar economic clusters in Asia, Europe and beyond, as there are various types of small-scale industries that grow organically within local settings where this approach can offer a deeper understanding of the dynamics of the city's economies in light of social capital networks.

1.9.   Theories and Conceptual Correlations

The context of Damietta exhibits a distinctive economic landscape with strong social patterns that depends on the nature of the furniture industry economy. In light of the environmental risk of sea level rise as well as a clear conflict with development strategies for the region, it becomes vital to reach solid grounds for realistic development, hence the need to bring in a composite understanding of the relevant theories and concepts to highlight the challenges and possibilities posed in this research.

This research investigates social capital as a variable that affects small-scale economies in Damietta. From this notion, the dynamics of grassroot economies and how they function within the context of profession-based social capital becomes a quite significant inquiry. The complexities that accompany investigating a dense and enclosed community such as Damietta also adds variables of meaning behind social and cultural bonds between individuals in the community. The argument in this sense transcends economic profit and becomes a mapping of a specific pattern of living that evolved in the city within the context of overlap between many factors.

Regarding **Social Capital Theory**, the research builds on the works of Putnam (2002., 1993), Coleman (1988, 1990), Lin (1999, 2003), Bourdieu (1986), Hunt (Hunt et al., 2015) and Burt (Burt, 1992, 2015) to investigate the theoretical underpinnings that relate to social capital in literature and the difference between

the qualitative and quantitative aspects of this theory. Qualitative understanding of the core of social capital and how actions and actors collaborate towards a system of reciprocity is highly important for the case of Damietta. Similarly, understanding the measurability and operation-ability of the theory on a live case frames the research and provides evidence to support development recommendations.

The other pillar of this research is understanding the basis of **grassroot economies**, which can be examined through understanding its nature as bottom-up collective economic approach, introduced within the work of Ruddick (Dissaux and Ruddick, 2017,Ruddick, 2015,Ruddick et al., 2015). Ruddick has guided the theoretical base for understanding grassroot economies and social capital as alternative currency. This pillar can also be seen from the perspective of its collective identity as an economic cluster. Hence, the research looks into the furniture industry enterprises in Damietta through interpreting Porter's **Competitive Advantage theory** (Porter, 1990) in the setting of developing countries. This particular investigation becomes relevant since it counteracts the current paradigm's claim of economic gain overruling identity and culture. It is a pragmatic approach towards sustainability encompassing all aspects of prosperity for the community. In light of this understanding of small-scale economies, Porter's Competitive Advantage Theory becomes exceptionally interesting. Porter states that companies gain advantage against their competitors as a result of pressure and challenge, in which case all competitors in the industry benefit from having strong local rivals, assertive home-based suppliers and demanding local customers (Porter, 1990). He argues that competitive advantage is created and sustained through a highly localised process, where competitive success is a reflection of differences between competitors in culture, economic structure and history among other factors. Building on Porter's theory, the concept pf producton cluster has emerged to relate competitiveness to economic georgraphy and regional economics,

focusing on quality and density of interlinks between organisations within the regional economy (Krätke, 2002).

Some examples of these approaches include industries that have evolved in cities for decades, such as Sassuolo in Italy and craft-based towns in China, while other example of innovative clusters initiated in the modern day is Silicon Valley. The idea of interconnected rivals who compete to improve the overall mass of economy has proven to be a success in many contexts with different industries.

The previously discussed theories evidently reflect on Damietta city's dynamics. The city exhibits assets of Competitive Advantage, a clear (and yet to be documented) social capital that relates to the history of furniture industry, and a unique pattern of life that vernacularly sustains itself and its users. This research attempts to grasp the different factors that relate to these conceptions and frame them into measureable variables for mapping social capital.

One of the concepts drawn upon in this research is Ruzek's claim that small scale economic activities offer higher sustainability than formal capitalistic ones (Ruzek, 2015). The concept is utilized in this research as a way to distinguish and evaluate the scale and patterns differences between MSMEs and DFC (Damietta Furniture City). This also reflects on **Eco-localism Theory**, suggesting the local economies depending on resources and social construct with inter-city and national link can be a more sustainable alternative to Globalisation (Curtis, 2003).

1.10. Expected Outcomes

As mapping the dynamics of Social Capital for grassroot industry in the city is the main aim, the research focuses on achieving key milestone outcomes in order to present statistically significant results. These outcomes are:

- Context-based Theoretical and Spatial framework that identifies indicators of social capital as related to spatial patterns of economic activities, including location, size and networks.
- GIS network map of social capital in Damietta for furniture industry.
- Recommendations for integral economic development in Damietta based on challenges and opportunities in context.

The current scope of this research focuses specifically on Damietta city and its local furniture-related economies (further in section 1.11 below); however, the approach used here could be applied for different urban contexts and for other industries that comprise a socio-spatial connection to the economy of a given city (further explained in research impact – section 1.8).

1.11. Research Scoping

The approach of this research started with investigating the largescale dilemma of the marginalized local economies, and how to achieve local sustainable development through utilising such existing local economies. Although it was a broad issue to examine, it was specific to studying MSMEs on an urban scale. Narrowing down the research boundaries was a necessity to achieve desirable outcomes (Figure 1-4). The first choice of the case study was Alexandria city, and a pilot interview was performed in Alexandria to examine the feasibility of the research problem (data presented in appendices). However, upon the investigation conducted in the pilot stage, it became clear that the local economies in Alexandria were quite diverse in nature, activities, geographical locations, as well as the threats and needs. This realisation was the first step towards funnelling down the study boarders. This led to a change in case study towards Damietta city, where a prevalent dominance of industry based MSMEs exists, all relating to one industry: Furniture making. From this point, examining the context started presenting rich boarders to the study. The most important one was realising that the most significant aspect that distinguishes Damietta's

industry from other locations or industries is the strong network and social capital that exists between its long-term residents. This was another funnelling down step in the process, where the investigation was now focused on social capital for the furniture industry, and how to map it and understand its dynamics. The final step in narrowing down the research at hand was the geographical aspect, which was identified during phase 1 of the fieldwork through examining GIS maps of the city and defining the geographical boarders of the study area (further discussed below).

Macro Scale Problem
Sustainability of small scale economies facing climate risk.

1 The main driver of the research started as the issue of sustainability of local economies in the city. The issue – although quite broad- was specific for MSMEs of the city scale.

Contextualisation
Identifying the case study and how to research problem fits within the context

2 The first choice of case study was Alexandria city. A preliminary study was conducted with interviews. The result was that the research problem was not exhibited within Alexandria city.

3 Damietta was chosen after the pilot study, where a strong industry-based MSMEs existed. The case study was fitting the aim and problem.

Defined Research Problem in Context
Narrowing down the research problem "Social Capital for Grassroot Economies"

4 Examining Damietta's context of furniture industry grassroot economies revealed that there is a key element that strengthens this cluster, which is **social capital**. Hence the research problem was re-defined investigate social capital for grassroot economies in Damietta.

Figure 1-4 - Research Funnelling Process (by researcher)

1.11.1. Scale of Intervention

As mentioned in the above section, the geographical boarders of the case study were quite paramount to defining the proper constraints of this research. To achieve quantitative measurements for social capital in a spatial context, the research adopted the area of central Damietta on both sides of the Nile River, where the oldest part of the city exists as well as the highest number of workshops (highlighted in Figure 1-6).

In terms of literature review and statistical data examination, a wider context is proposed for the study which comprises the official boundaries of the city of Damietta, the capital of Damietta governorate (where the GIS city centre boarder is located). Reasons for this choice include the fact that it is the largest urban agglomeration in the governorate, as well as having historical significance to the region as being the former northern gateway to Egypt (El-Gammal, Ali, and Eissa, 2014). The following map (Figure 1-5) highlights the boundaries of the city of Damietta, which are the proposed boundaries of the research area.
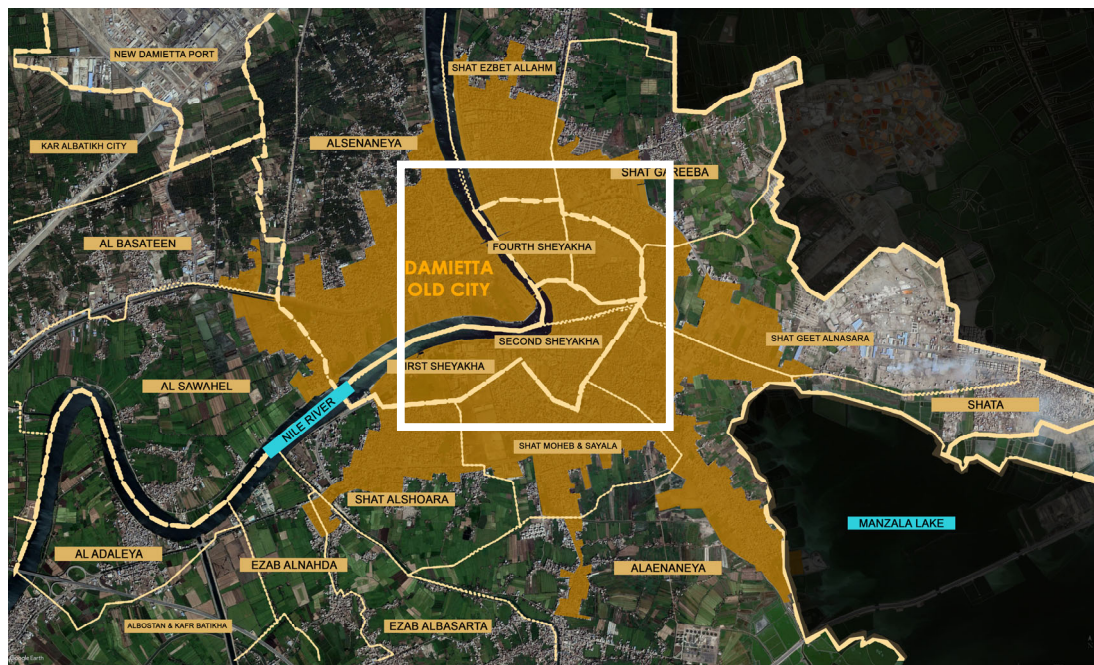
Figure 1-5 – Study Boundaries: Map of urban mass, logistic boundaries and main features in Damietta– Developed by researcher from Google Maps 2018.

Figure 1-6 - Research Boundary - From GIS Map Of Damietta (CAPMAS, 2019)

1.12. Research Structure

The proposed structure targets following a coherent sequence of problem formulation, data collection, analysis and application to make sure the primary aim of the research is met. The research is divided into four parts, each comprise relevant chapters contributing to the research sequence. The research structure is summarized in Figure 1-7 below, with reflection on research objectives in Figure 1-8.

Part 1 (chapter 1) describes the research problem, aim, objectives, and hypothesis, among other attributes of the research approach. Part 2 (chapters 2 and 3) comprises the second phase of the research which is a comprehensive literature review, identifying the relevant literature, to increase the reliability of the concluded framework. This was done according to the thematic topics of the research, i.e., social capital and networks as well as economic clusters and grassroot economies. Part 3 (chapters 4, 5 and 6) includes research design, with a detailed research methodology including philosophical stance, methods and

tools used in the research. It also illustrates the theoretical and spatial framework, as well as the case study investigation, which includes the choice, sampling and any context-specific research design that needed in data collection.

Part 4 (chapters 7 and 8) describes the analysis and synthesis of the collected primary data towards conclusions and recommendations. These draw on the previous research phases and reflect on future research.

PART 1: INTRODUCTION — *Ch1: Introduction to Research*

Aim + Objectives	Research Scope
Research Problem + Questions	Research Limitations
Justification	Time Plan
Hypothesis	Expected Outcome

PART 2: LITERATURE REVIEW

Concept Mapping

Ch2: Social Capital, Networks and the City

Ch3: Economic Clusters And Grassroot Economies

PART 3: RESEARCH DESIGN

Ch4: Research Methodology

Philosophical Stance
Methods
Ethical Considerations

Ch5: Theoretical & Spatial Framework

Framework development
Framework Validation (interviews)

Ch6: Case Study – Damietta's Furniture Industry

Primary Data Collection
Secondary Data Review
GIS Mapping

PART 4: ANALYSIS & CONCLUSIONS

Ch7: Findings & Analysis

Qualitative - Interviews
Urban Observations
Survey – Statistical Analysis
Social Capital Network Analysis

Ch8: Conclusion & Recommendations

Figure 1-7 - Research Structure and Chapters Correlation
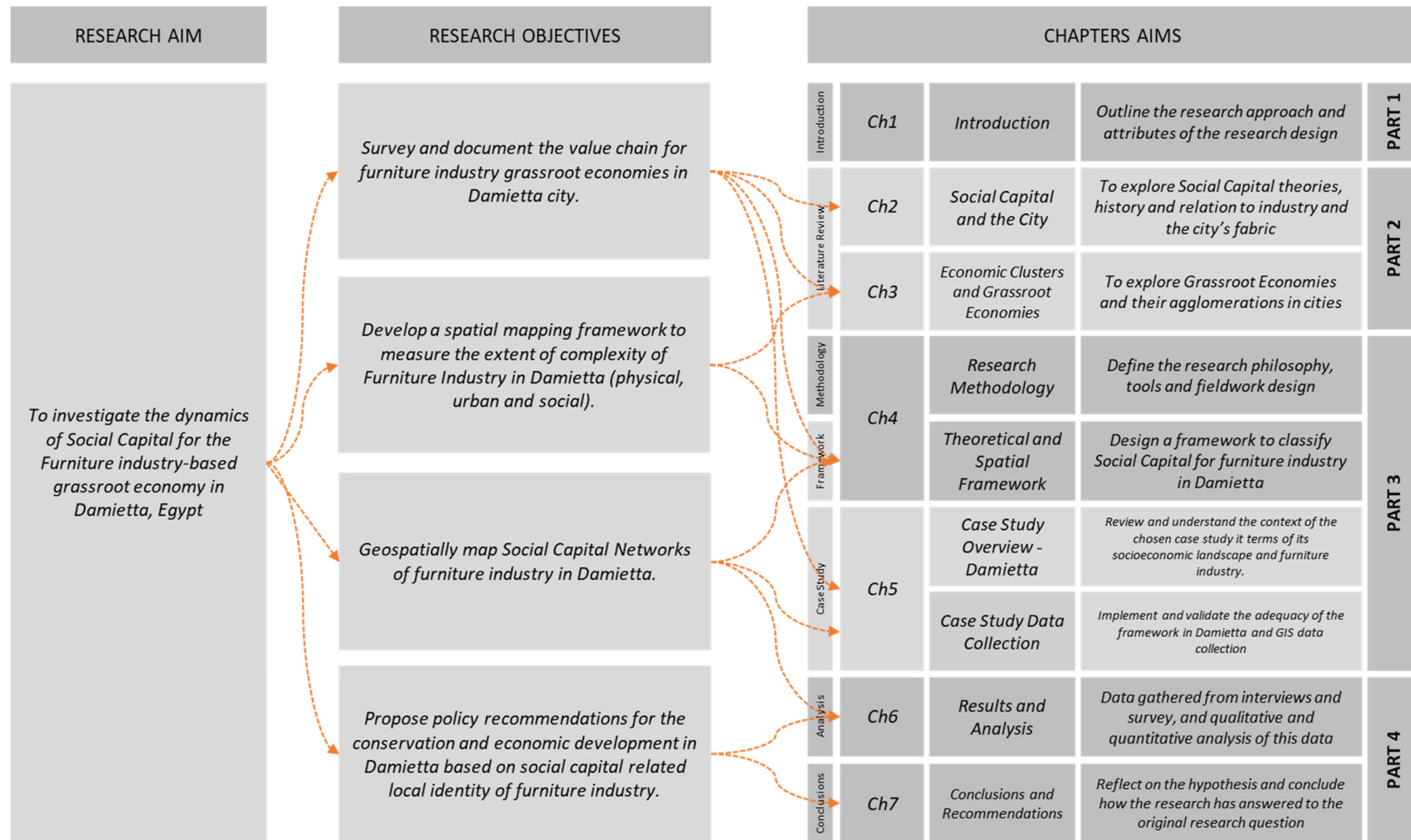
Figure 1-8 - Reflecting on research structure vs aims and objectives

1.13. Research Limitations

Certain limitations affected the methodology and path of the research, which needed to be taken into consideration in research design, to avoid hindering the execution and application phases. Firstly, the context under study being in the Global South had obvious consequences on the research design and data acquisition. Collecting secondary data from authorities or institutions such as GIS maps and statistics included logistic challenges and lengthy follow-ups to secure the correct data. The data on the GIS base map was limited and sometimes needed clean-up, which was also another limitation that the researcher needed to deal with before starting the survey and primary data collection. It is also worth mentioning that the data acquired was the last update available, which was 2016 census data, hence not exactly reflecting the current situation in Damietta. The researcher included observations along with the survey design phase to spot any updates that might not be mapped on the census data. Utilising observations would provide higher reliability of the research findings compared to use of only GIS census data.

The community in Damietta is a rather 'closed' circle with strong social bonds. Finding a way into the community for carrying out interviews and the survey is a challenge faced by the researcher. Local connections with Damietta residents (Gate-keepers) helped the researcher visit various workshops and factories for interviews as well as for establishing connections for survey phase. However, it is still a challenging task to carry out the survey for many residents given the community's close-knit fabric.

The sociocultural preferences and behavioural patterns of individuals working in the furniture industry is also to be taken into consideration, since this might be a challenge during surveys and interviews. In the case of using enumerators, training and orientation on cultural preferences in Damietta as well as how to carry out the research tools were conducted to minimize errors. Researcher and

enumerators maked sure to abide by cultural values of the community such as humble dressing, since most of the interviewees/participants are men, who might be offended by more modern clothing (especially of females).

Given the dynamic of the context under study, further limitations arose while executing the research. The researcher has planned for possible errors and time-consuming activities during data collection, so as to have time failsafe regarding fieldwork execution in case of any unforeseen challenges.

COVID-19 UK lockdown has also been a challenging stage for the researcher and delayed the data analysis phase for a about 6 months. The researcher worked on overcoming this phase and continued to work on the research with an adjusted time plan (in Appendix 2).

1.14. Chapter Summary

This chapter introduced the argument upon which this research is based, including the problem identification, hypothesis, gap in knowledge and justification of research approach and strategies. Plan, key milestones and expected output and impact for the research have also been identified to set the path for the following chapters.

2 & 3

Concept Mapping

This section shows a map of the concepts and terminologies adopted in this research, and how they interlink towards the main aim. The purpose of this mapping is to understand the key issues as related to one another, leading up to the research gap. Another useful feature is to congregate all vital terminologies that need to be intensively visited in literature. The main two variables are social capital and grassroot economy. The third major factor is context under study (Damietta, Egypt) and the wider Global South. From this scheme, links are investigated relevant to research problem and gap.

Firstly, investigation of the social capital included an understanding of the theories that contribute to this research, including the work of Putnam, Coleman, Bourdieu and Burt. Network mapping and how it fits within the context of social capital modelling is also another aspect to be explored within the first section. The second topic being grassroot economies is investigated in relation to Porter's Competitive Advantage Theory and Eco-localism as an alternative to Capitalism. The fieldwork as indicated is designed according to the concluded understanding of these concepts and their integration into Geospatial network mapping in the city of Damietta. The main terminologies according to the concept map will be discussed in the following section.

In Figure 1-9, key terminologies are reviews and defined. The below concept map along with the glossary in Thesis Supplementary Information
, act as a guide for further analogies in the following sections using jargon specific to the field.
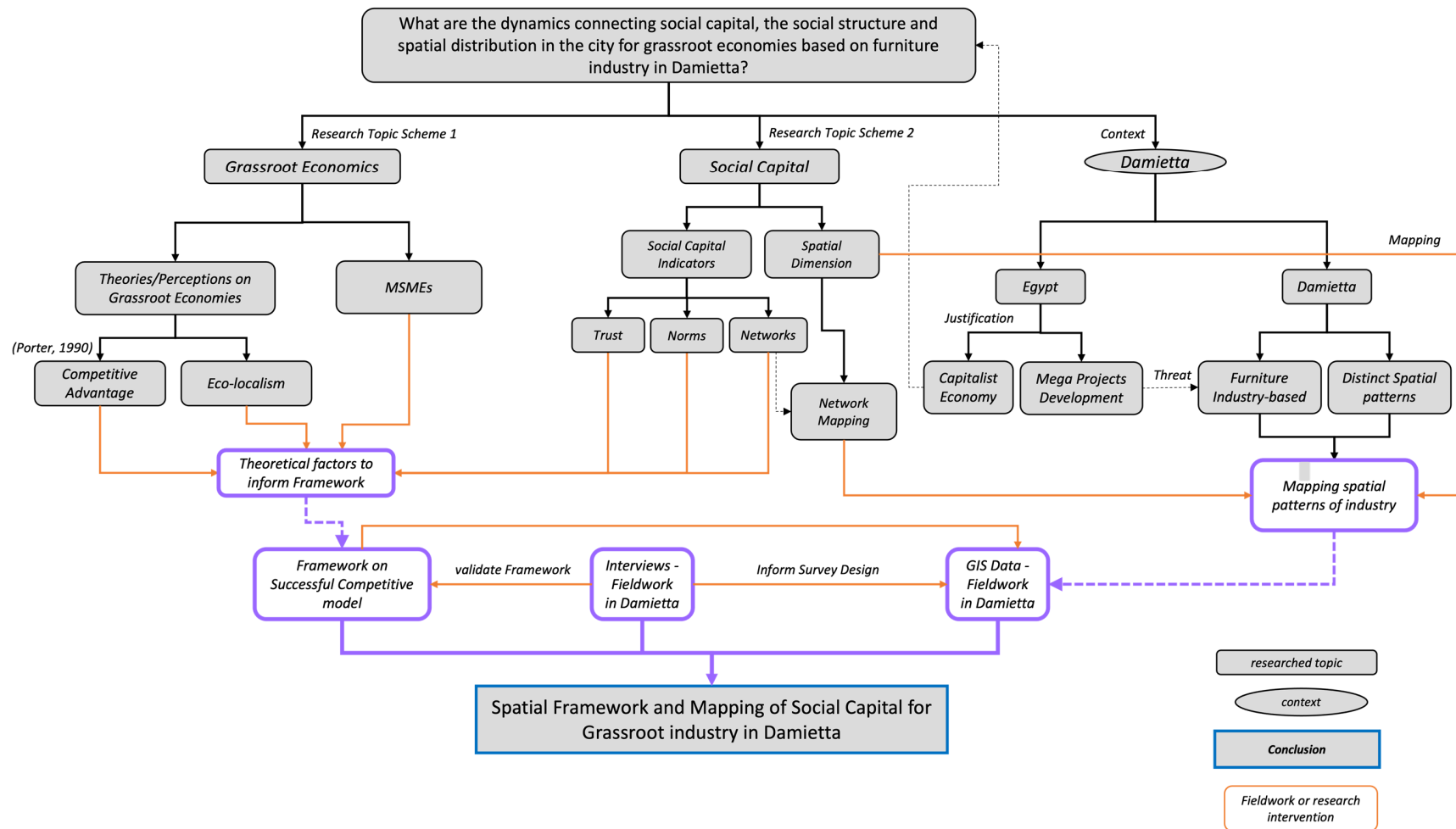
Figure 1-9 - Concept mapping of research ideas (collated by researcher)

2

CHAPTER 2 – SOCIAL CAPITAL, NETWORKS AND THE CITY

2.1. Introduction

This chapter includes a comprehensive profile on social capital in terms of theories, history, implementation on different contexts as well as the relationship between industry and social capital. The work of Putnam, Coleman and Lin were the base of the theoretical underpinning for this chapter. The link to grassroot economies and economic agglomerations is introduced in the following chapter.

2.2. Capital and Social Capital

Although the idea of capital can be traced back to Marx defining it as the surplus value captured by the capitalist bourgeoisie controlling production means between commodities and monies (Brewer, 1984,Marx, 1999), social capital can be argued as a 'form of the neo-capital theories' (Lin, 2001). Within a capitalist society, in addition to being identified as the surplus value (product) from the production process, capital can also be defined as the investment in production and circulation commodities by capitalists, with expected returns from the market (investment process). This is considered as a 'classical' perspective of capital, built on the exploitative relation between two classes; the dominant who control both the investment process and the surplus, and the working class (Lin, 2001).

Neo-capital Theories tried to refine the understanding of capital in light of arising complexities in the society. Through all those perspectives, capital remains to be the surplus value, though defined differently in each context (Table 2-1). For

instance, Human Capital Theory describes how individual workers invest in skills and knowledge in order to negotiate with those controlling the production process for higher pay and/or benefits (Becker, 1993,Johnson, 1960,Schultz, 1961). The payment has higher value than equivalent commodities, and thus contains surplus (capital) which can be utilised for purchasing further needs, commodities or leisure (Lin, 2001). Similarly, Cultural Capital is a surplus that results from the investment of the dominant class in reproducing a set of symbols and meanings internalised by this class as their own (Bourdieu and Passeron, 1990,Lin, 2001). The shift of the labour masses to produce their own capital and the shift of the society from a layered dichotomised struggle between production control and labour resulted in what Lin (*1999*) called neo-capitalist theories, where social capital is the third of the above-mentioned human and cultural capitals.

Table 2-1 - Theories of Capital (Lin, 2001)

	The Classical Theory	The Neo-Capitalist Theories			
		Human Capital	Cultural Capital	Social Capital	
Theorist	Marx	Schultz, Becker	Bourdieu	Lin, Burt, Marsden, Flap, Coleman	Bourdieu, Coleman, Putnam
Explanation	Social relations: Exploitation by the capitalists (bourgeoisie) of the proletariat	Accumulation of surplus value by labourer	Reproduction of dominant symbols and meanings (values)	Access to and use of resources embedded in social networks	Solidarity and reproduction of group
Capital	A. Part of surplus value between the use value (in consumption market) and the exchange value (in production-labour market) of the commodity. B. Investment in the production and circulation of commodities.	Investment in technical skills and knowledge	Internalisation of misrecognition of dominant values	Investment in social networks	Investment in mutual recognition and acknowledgement
Level of Analysis	Structural (classes)	Individual	Individual/class	Individual	Group/Individual

2.3.   Social Capital: What, How and Why?

The concept of social capital can simply be explained as "investment in social relations with expected returns" (Lin, 2001), which is highlighted in various ways in the works of Putnam (*1995, 2002*), Coleman (*1988*), Lin (*2001*) and Hunt (Hunt et al., 2015). This implies that engaging in networking interactions produce profits. In other words, social capital is "resources embedded in relationships among actors" (Hauberer, 2011).

Lin (*1999*) illustrated the breakdown of "How and why" social capital produces/enhances profit into four factors. The first is that social capital facilitates the flow of ***information***, which indicates that social ties to individuals in strategic locations in the market can provide the user with information about opportunities otherwise unavailable, and similarly inform an organisation about the abilities of an individual otherwise unrecognised. This reduces the costs for organisations to find "better" skilled individuals or for individuals to find "better" organisations to utilise their human capital (skills) with favourable compensation. The second factor is the ***influence*** that social ties may provide in decisions regarding an individual, for example in hiring or promotion process. Strategic social ties -especially in authoritarian or supervisory positions- exercise power in "putting in a work" within organisational hierarchy. The third aspect of social tie resources is the certification of an individual's ***social credentials***, which reflect the individual's accessibility to resources through their social capital. A person can be of higher value to an organisation as they offer their social connections in addition to their personal skills, which could be useful to the organisation. Finally, ***reinforcements*** assure that a person's identity is recognised as worthy as an individual and as a member of a social group sharing similar interests. This assures not only one's identity but also acknowledges their claim of certain resources, hence acknowledges their entitlement to those resources. According to these four elements, social capital operates in a different manner to economic or human capital and the instrumental actions taken within

the framework of social capital are not accounted for by the other forms of capital (Lin, 2001).

2.3.1. Understanding Social Capital Aggregation

In order to explain the phenomenon of social capital in a community, "Coleman's boat" can be utilised as an appropriate representation that links the macro and micro levels of system behaviours and the actions of the actors that interrelate with the system (*Coleman, 1990*). Figure 2-1 below highlights the components of Coleman's boat and how it aids to understanding social phenomena, including social capital aggregation. The microscale mirrors the purposive actions taken by individuals and their consequences on other individuals, while the macroscale mirrors the social structure as a system with its rules and conditions. The phenomenon is generally on a macroscale and is explained through a three-part paradigm consisting of type 1, type 2 and types 3 relations; macro-to-micro transition, purposive action of individuals and micro-to-macro transitions. Type 1 relations are the initial conditions of the social structure that imply rules, norms or constraints on the actions of its individuals. Relatively, Type 3 relations represents the aggregation of individual actions to collectively formulate a difference in the social structure (outcome). Type 2 relations on the micro-level account for the reciprocal individual purposive actions taken by actors according to their beliefs or interests (*Coleman, 1990*). Through this micro-level interpretation, an explanation of the macro-level changes can be obtained.(*Coleman, 1990*).

According to this preposition, social capital in Damietta's furniture industry -as a social structure phenomenon- can be explained through understanding the macrolevel paradigm of the enclosed nature of the community in Damietta throughout the 20th century, part of which is the strong system of social and cultural norms that governed the community's functions and relations between individuals. With the presence of skilled labour in the craft of furniture-making, individuals started capitalising on their skills and the existing bonds between the

community built on common respect of norms and traditions to create enterprises/workshops in the furniture-making business to achieve economic gain. This gain mutually expanded as the relations were stronger between individuals, which collectively formulated an agglomeration of furniture industry enterprises with a high concentration of social capital between its owners and workers. ***Interdependence of actions*** has also played a significant role in the compilation of this agglomeration, where bilateral exchange in a competitive market depends on the rules that might have been socially agreed upon or sanctioned by the actions of one or more influential individuals (socially or economically) in the market (*Coleman, 1990*).(*Coleman, 1990*).
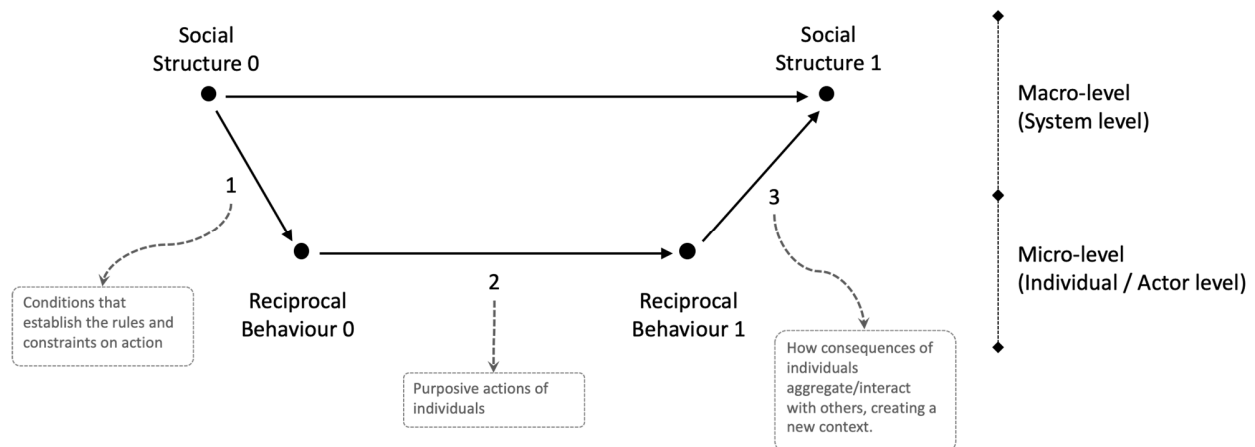
Figure 2-1 - Conceptual outline of macro- and micro-level propositions of Coleman's boat (adapted by author from: *Coleman, 1990* and *Ochiai, 2015*)
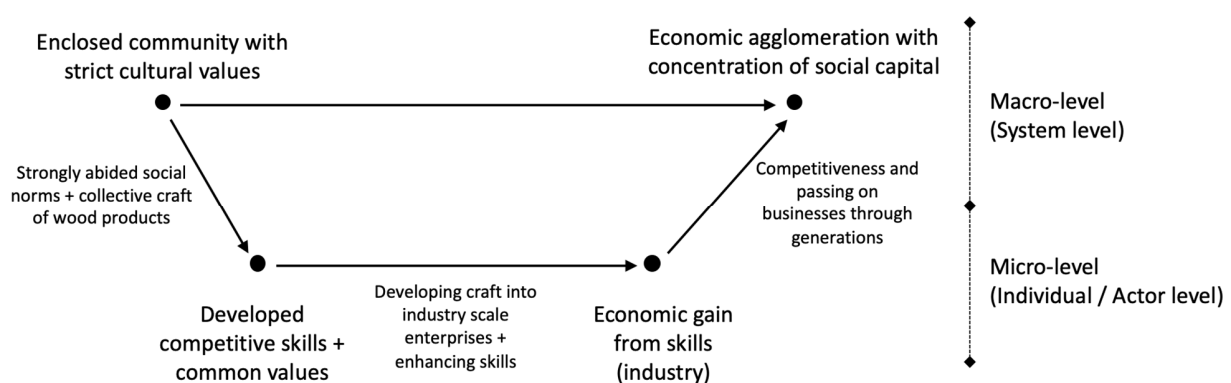
Figure 2-2 - Macro- and micro-level proposition of Coleman's boat for Furniture industry in Damietta (adapted by author)

2.4. Perspectives, Theories and Controversies on Social Capital

Social capital can be tackled from two specific perspectives: individualistic and group-level. The first individual perspective implies that individuals invest in and access resources embedded in their social networks to gain returns, which is almost similar to human capital in terms of investing in oneself (investing in one's networks in this instance). Although aggregation of individual returns benefits the collective, the focus here is mainly on the individual in terms of how they invest in social relations and how they capture embedded resources in their relations to generate return benefits/profit (Lin, 2001). The works of Lin (Lin and Bian, 1991,Lin and Dumin, 1986,Lin, Ensel, and Vaughn, 1981), Burt (1992; 1997), Marsden (Campbell, Marsden, and Hurlbert, 1986,Marsden and Hurlbert, 1988), Flap (Boxman, De Graaf, and Flap, 1991,Flap and Völker, 2004,De Graaf and Flap, 1988) and Portes (Portes and Sensenbrenner, 1993) support this perspective and tackle it in various cases. The second perspective focuses on the group level, in terms of how groups develop and maintain more or less social capital as a collective asset, and how this asset enhances the group members' chances. Bourdieu (1986), Coleman (1988, 1990) and Putnam (2002, 1993) have focused on this perspective extensively, concentrating on the processes of production and maintenance of this collective asset. Although the individual networking and interaction of an individual is acknowledged, issues of degree of closure or density of the network as well as norms and trust among a group are emphasised within this conception of social capital. It is also worth mentioning that as a neo-capital theory, social capital -and both its perspectives- consensually view the interacting members of the group as the producers and reproducers of social assets (Lin, 2001). The identification of social capital as one or the other of those two perspectives has been a widely debated aspect, with the question of whether social capital is collective goods or individual goods(Lin, 2001). Most scholars research consents that it is a mixture of both.

Social capital has evolved as a concept through the works of different theorists. Although Bourdieu's (*1986*) work includes discussion of cultural capital theory (Table 2-1), he also provides a structural view explaining and aggregating social capital, one which focuses on the size and volume of the capital possessed by members, and how the interactions of any given members enforce the mutual recognition of those members in the network (Lin, 2001). Coleman (*1990*) stresses on trust, norms, sanctions, authority and closure as forms of collective social capital, while also emphasising the individual's use of socio-structural resources in gaining better results (Lin, 2001).

Debated issues around social capital include relating the aggregation of collective values of economic, political, cultural or social connections/relations, with other collective terms such as trust and norms. Literature includes a display of substitutable terms or measurements that all convey solidarity and social integration with no specificity of each term's place in theory. Lin (*1999*) argues that social capital must be distinguished from collective assets such as culture, norms and trust. It is a relational measure with which other collective assets (such as trust) causally correlate without being defined by one another.

The closure or density of social networks is also a significant matter among the debates on social capital. Bourdieu (*Bourdieu, 1986*; *Coleman, 1990*; *Putnam, 1995*; *Putnam et al., 1993*) assumes that a certain degree of closure is given within the network, with focus on his work on dominant class values as an investment in mutual recognition to maintain the group's dominant position, where membership is clearly including only individuals of noble status. Even though Coleman does not share this class view, he consents that network closure is a distinctive advantage of social capital for the reason it maintains and enhances collective values such as trust, norms, authorities and sanctions. Lin (*1999*) on the other hand suggests that closure for the utility of social capital is neither necessary nor realistically given. Bridges, structural holes and weak ties (Burt, 1992,Granovetter, 1973) are vital for enabling information and influence

flows. Dense or closed networks produce an advantage when the aim is to preserve or maintain resources (expressive actions) (Lin and Bian, 1991,Lin and Dumin, 1986). From this perspective, Bourdieu's dominant class situation would conveniently include a denser network to preserve and reproduce resources. However, this is not the event for obtaining resources that are not presently existing (instrumental actions) in a quest to, for instance, find a job, in which case evaluating and accessing bridges in the network would be beneficial (Lin, 2001). This latter statement is the basis of Lin's proposed theoretical conceptualisation of the denser versus more sparse networks in terms evaluating each case and postulating deductions of the suitability of more dense networks for maintaining resources, while open networks for access to advantages and enhancing opportunities.

Coleman (*1990*) also argued that "social capital is defined by its function" and "it is not a single entity, but a variety of different entities having two characteristics: They all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure". This functionality argument implies tautology, which suggests that social capital is only identified when and if it works, where the cause is captured by the effect. This formulates a predicament where the theory is explained, both cause and effect factors in a single equation, which is theoretically invalid. Although there is a functional relation indeed, yet the two concepts must be treated as separate with independent measurements. For example, social capital (cause) is the investment in social relations, but better job (effect) is the occupational status or supervisory position (Lin, 2001).

Another controversy of social capital is related to measurement, which also relates to Coleman's argument that social capital is indistinguishable from its outcome, or that it can be seen through many different forms as trust, norms, sanctions, authority, etc. Coleman questions "whether social capital will come to be as useful a quantitative concept in social science as are the concepts of

financial capital, physical capital, and human capital remains to be seen; its current value lies primarily in its usefulness for qualitative analyses of social systems and for those quantitative analyses that employ qualitative indicators" (*Coleman, 1990*). Lin (*1999*) argues that once issues of identifying the terms and expected theoretical position for each component are resolved, social capital "should and must be measurable".

Table 2-2 - Controversies around social capital (Lin, 2001)

Issue	Contention	Problem
Collective or individual asset (Coleman, Putnam)	Social capital as a collective asset	Confounding with norms, trust
Closure or open networks (Bourdieu, Coleman, Putnam)	Group should be closed or dense	Vision of class society and absence of mobility
Functional (Coleman)	Social capital is indicated by its effect in particular action	Tautology (cause is determined by effect)
Measurement (Coleman)	Not quantifiable	Heuristic, not falsifiable

2.5. Social Capital as a System

Understanding the nature, constituents and relations within a social network brings into perspective the making units of the system, and hence a comprehension of the link between theory and application, between Coleman, Putnam and Bourdieu's work and Damietta's small workshops. Through the following sub-sections, a review of social networks is presented with links to theory. Further reflection on Damietta's furniture industry network is included in the analysis chapters 4.9 and Chapter 6.

2.5.1. Social System Elements (Building Blocks)

According to Coleman (*1990*), a fundamental social network consists of two types of elements: 1) The Actors, and 2) The things over which they have control and in which they have interest. The latter can be classified into resources or

events according to their characteristics. The relations between actors and resources/events can either be control or interest as mentioned above. If actors can control all the resources that they have interest in, then all they would need is to exercise their control in a way to satisfy their interests. The idea that makes a social system is the simple fact that actors do not have full control over the activities that can satisfy their interests, which implies that those activities are controlled (partially or fully) by other actors. Hence, in order to satisfy one's interests, one must engage in transactions with other actors. These transactions fall under the conception of exchange in a sense that includes many other processes such as bribes, threats, promises and resource investments. In this way, actors are able to utilise the resources they control (which might have little interest for them) to gain their interests that lie in the resources controlled by others. The following figure shows the minimum basis of a social system, involving two actors, each having control over the resources that interest the other. This structure along with the factor that the actors are purposive (with a target of achieving their interests to the fullest) gives systemic character to their actions (otherwise known as interdependence).
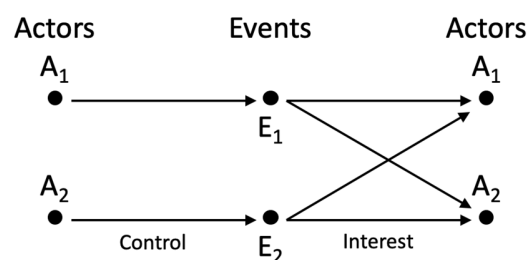
Figure 2-3 - A minimal social system of actors and resources/events (*Coleman, 1990*)

2.5.2. Types of Interdependence

Friedman (Coleman, 1990,Friedman, 1983) explored the market networks through the types of interdependence among actors, which he identified as three kinds; structural, behavioural and evolutionary. ***Structural interdependence*** is where each actor assumes the actions of other actors independent from their

own. Hence, in this perspective, the environment is a fixed variable not reactive – such as prices in a stable market*. **Behavioural interdependence** is such that the actions of each actor are conditional on those of others at an earlier point in time. In this situation, the actor must make the decisions according to more complex considerations than in the case of structural interdependence. The actor understands that the consequences of his actions affect him both directly and indirectly through affecting someone else's actions, which might be an iterative chain of events affecting the actor and others' subsequent actions – such as bargains between two or more actors in which each actor's strategy depends on knowing both the interests of the other as well as their strategy for bargaining. The third type is **evolutionary interdependence** is where behavioural interdependence has continued over a long period of time, and through selective survival, the mix of strategies in the population has reached an equilibrium.

This research adopts the simplest type, which is structural interdependence. The reason for such choice is to simplify the process of measurement in order to be able to unify variables on a city scale within the timeframe of the study. If further complexity is adopted, generalisation on a population and measurement of variables would be unattainable given the constraints and aim of this research.

2.5.3. Structures of Action

There are various structures of action present in a society, which depend on the kinds of resources involved in the actions as well as the kinds of actions taken and the contexts within which the actions are taken (*Coleman, 1990*). The following diagram illustrates the different structures that fall under the umbrella of purposive action, which include collective actions (actions with externalities – circle F) and transfer of resources or rights – circle B. (*Coleman, 1990*).

Circle B (transfer of rights or resources) generally includes transfers are made in exchange between actors, however, a subsection of it are actions made

unilaterally (circle C). The exchange transfers can be classified as a transfer of rights to control one's own actions (circle D), and transfers that are made as part of a system of relations (circle E).

From the eleven regions identified by Coleman (*1990*) in the above diagram, this research focuses only on three, namely: regions 3,6, 9 and 10. Region 3 involves the actions of exchange relations within a system of exchange (market), which is separated from authoritative relations. Region 6 involves unilateral transfers of resources whether tangible or intangible, including trust. Region 9 is the systems of relations that arise through unilateral transfer or resources, and region 10 represents actions with externalities, which is the class of actions for which norms arise and formulate.

1. Private actions
2. Exchange relations
3. Market
4. Disjoint authority relations
5. Conjoint authority relations
6. Relations of trust
7. Disjoint authority systems

Exchange relations (mutual)

Unilateral relations

Structures of social actions studied in this research
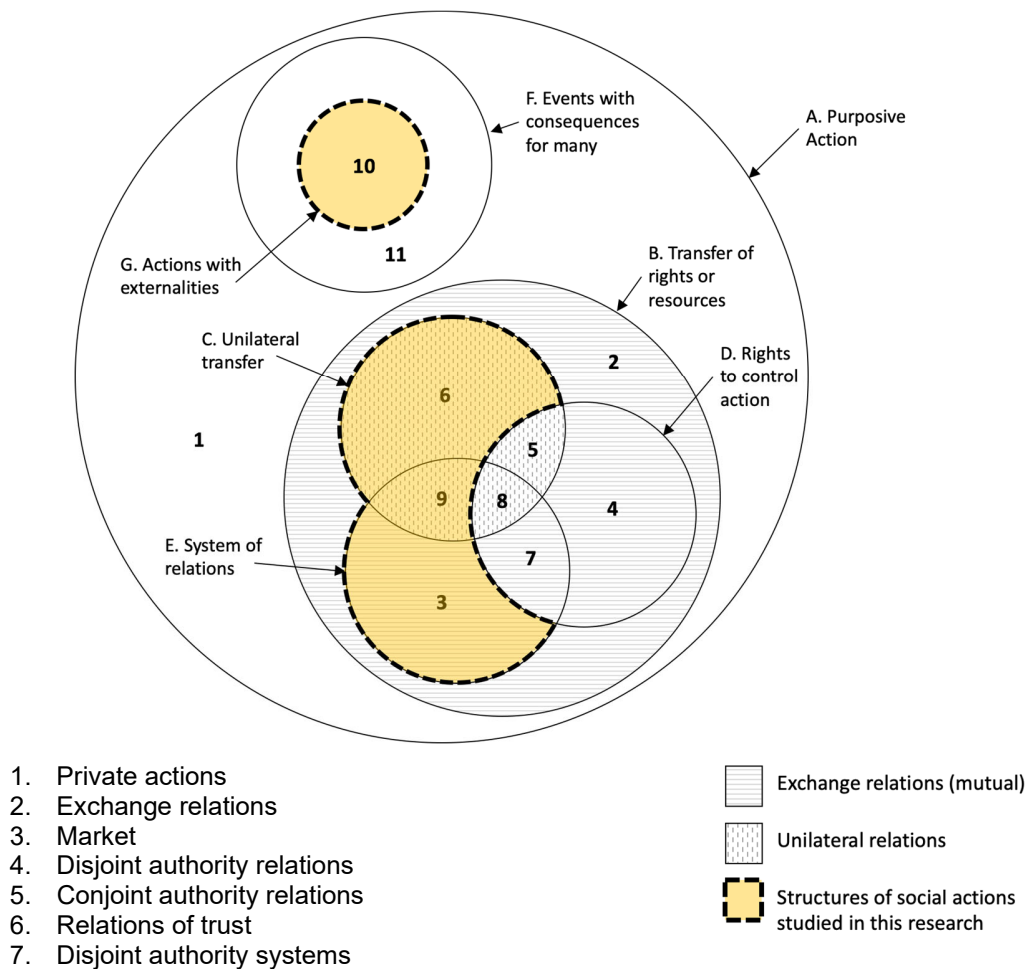
8. Conjoint authority systems
9. Systems of trust, collective behaviour
10. Norm-generating structures
11. Collective-decision structures

Figure 2-4 - Map of the structures of social action (Developed by author from *(Coleman, 1990)*)

The study of regions 3, 6, 9 and 10 interprets the intersection between market network transactions, dynamics of trust between individuals, and the norms that govern the relations between those individuals, which in summation are the dimensions of social capital. This research is discarding issues that relate to socio-political factors that relate to the authoritarian dynamics of the market and the relation of market users to their authority representatives in the government. Partially this is to focus the scope of the study to a tangibly measurable set of variables within a controllable level of complexity, yet it is also vital to mention that the authority scale in relation to the market in the Egyptian context formulates a rather complex dynamic in which the political landscape might cause instability to the results of any such study of any industry in the area.

2.6. Social Capital Dimensions

Social capital has been studied as a domain and its dimensions have evolved through various researchers' additions over time to include more dimensions and concepts. Building on the works of Putnam (*1995, 2002*), Coleman (*1988*), Lin (*2001*) and Hunt (Hunt et al., 2015), a comprehensive assortment of social capital factors of measurements have been identified, namely; Social Cohesion, Networks and Norms as the main divisions. Social cohesion includes measures of social solidarity, trust and reciprocity. Networks includes Embedded Resources and Network Locations. Lastly, Norms comprise belief in activities collegiality and agreeing with collective rules. The following diagram illustrates the measurements adopted in the study for evaluating the volume of social capital.
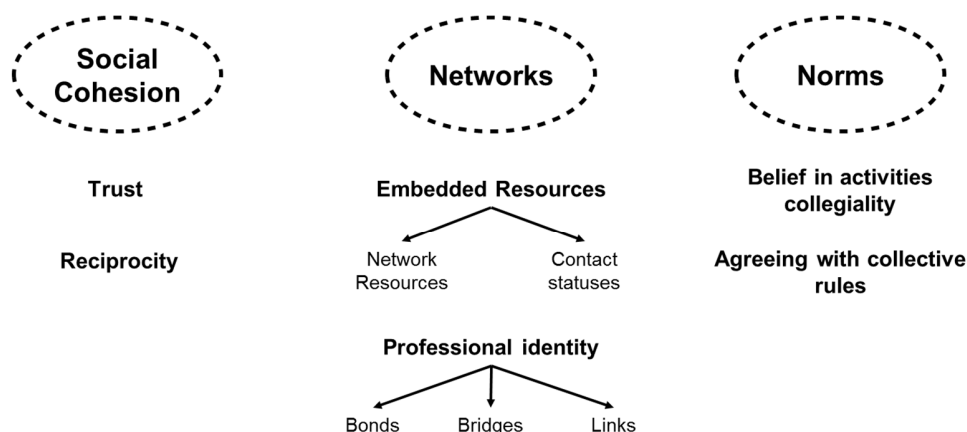
Figure 2-5 - Factors of Measuring social capital (Coleman, 1988; Hunt et al., 2015b; Koivumäki, 2013; Lin, 1999; Putnam, 1995, 2002; Putnam et al., 1993)

2.6.1. Trust and Reciprocity

"Without trust only very simple forms of human cooperation which can be transacted on the spot are possible, and even individual action is much too sensitive to disruption to be capable of being panned, without trust, beyond the immediately assured moment"

(Luhmann, 1979 in: Misztal, 1996)

Trust can be argued to be the core indicator of social capital, indirectly and unsystematically shaping all aspects of human life (Misztal, 1996). A classical reference to the significance of trust is Tocqueville's description of the civic community as "marked by a social fabric of trust and cooperation and reliant upon the activities of a public-spirited citizenry" (Misztal, 1996). In the above quote, Luhmann illustrates the most fundamental need for trust, which lies in the simple relation between cooperation and time. The pursuit of more complex cooperation -in other words a structure of social actions(*Coleman, 1990*)- involves a series of actions, which plausibly take expend over longer periods of time. In the absence of trust, those actions cannot take place, hence hindering all but simple single-action cooperation, which implies hindering the whole structure of action. Within transactions between actors, the incorporation of risk into the decision of whether to go through this action quite simply depends on

the presence or lack of trust (Coleman, 1990). Amongst the many definitions of trust in literature, one relates mostly to the focus of this research: "a set of expectations shared by those in an exchange" (Misztal, 1996,Zucker, 1986). From an anthropological point of view, reciprocity is a vital factor in sustaining exchanges as trust enforces and obligation which prolongs partnerships (Misztal, 1996,Sahlins, 1972).

Within sociological literature, trust has been identified in one of three ways: as a property of an individual, as a property of social relationships or as a property of the social system based on individual actions of actors (Misztal, 1996). The first approach sees trust as a personal characteristic, focusing on emotions and individual values. Here trust is a function of individual variables (Cole, 1973,Deutsch, 1958,Wolfe, 1976) such as honesty, loyalty and sincerity. This approach is argued to lack social context which may alter the degree of trust for the same individuals, which methodologically reduces the complexity of trust to a theoretically debateable scale (Misztal, 1996). The second approach views trust as a collective attribute application on the institutional scale, explaining how systems like Fordism production can be described as "low-trust" systems (Fox, 1974), while "flexible specialisation" or post-Fordist manufacturing are "trust dependent systems" (Hirst and Zeitlin, 1991). Trust in this perspective is a social resource that can be capitalised upon in order to achieve organisational goals (Nachmias, 1985). The third perspective -which is the focus of this research- understands trust as a valued public good, sustained by the actions of actors in the society. In Damietta, furniture industry enterprises (MSMEs) place high regard on trust between its members as a valued public good, as well as a resource for getting more business through referral.

Putnam's work explains that trust is a fundamental factor for achieving democracy (Putnam et al., 1993) as being part of the social capital which is essential for "effective, responsive and representative institutions" (Misztal, 1996,Putnam et al., 1993).

2.6.2. Networks

Among the three social capital dimensions, networks are the most measurable and tangibly quantitation elements. According to Burt (*2000*), focusing on network mechanisms that affect social capital offers a more transdisciplinary perspective across theory with empirical evidence rather than loosely tied metaphors and indicators used in a number of social capital research. Since this study seeks quantitative measures, there was a focus on the empirical work of Burt (*1992*, *2000*, *2001*) and Coleman (*1990*), investigating **Structural Holes Theory** versus **network closure** as social capital. Burt argues that the two network mechanisms work differently and can bring various additions to the magnitude of social capital if utilised collectively within a "more general model of social capital" (Burt, 2000).

According to Burt's analysis of a generic sociogram and density table (Figure 2-6), within the market, people meet and exchange actions of mutual benefit, yet the network residue from a single day's interactions is theoretically irrelevant to the market behaviour of the day after. The network recurs only if the same people meet and exchange the same actions. The recurrence of the network in this generic perspective would be a function of supply and demand, as well as relates to information about the market goods and, sellers and prices. However, Burt argues that because information is an important influencer of actions in the market, the structure of prior relations and network mechanisms between actors can affect, or replace, information. This happens specifically when the information in the market is ambiguous that people rely on their networks for intel, or when the action is so complex that no amount of the available information can lead to a clear choice (Burt, 2000).
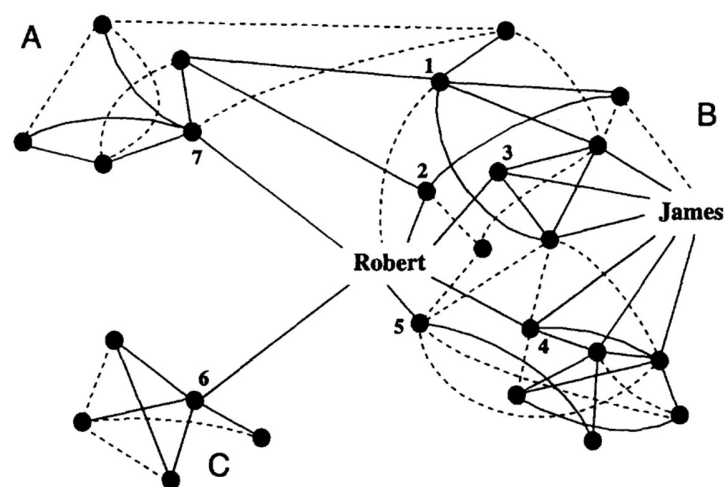
Density Table of Relations Within and Between Groups

.65			Group A (5 people and 8 ties; 5 strong, 3 weak)
.05	.25		Group B (17 people and 41 ties; 27 strong, 14 weak)
.00	.01	.65	Group C (5 people and 8 ties; 5 strong, 3 weak)

Figure 2-6 - Social Organisation - Generic sociogram and density table (Burt, 2000)

The effect of lack or ambiguity of information on the actors' actions can be described as a behaviour of contagion and/or prominence. When information is not clear, actors/institutions either turn to observing and imitating peer behaviour to make their decisions (contagion) (Burt, 2000,White, 1981), or make their decisions upon the prominence/status of the sellers within the market (prominence). Both contagion and prominence are mechanisms that describe social capital, since the first ensures that certain beliefs and practices are transmitted amongst the actors, while the second gives an advantage to actors with higher status in the market (Burt, 2000,Podolny, 2019). The following Figure 2-7 shows the types of network structure models that relate to contagion, prominence or range of the network.

Social Capital Metaphor
advantages that individuals or groups have
because of their location in social structure

Network Models of Contagion
(information is not a clear guide to behavior, so observable peer behavior is taken as a signal of proper behavior)

Network Models of Prominence
(information is not a clear guide to behavior, so the prominence of an individual or group is taken as a signal of quality or resources)

Network Models of Range

Closure
(competitive advantage comes from managing risk; closed networks enhance communication and facilitate enforcement of sanctions)

Brokerage
(competitve advantage comes from information access and control; networks that span structural holes provide broad and early access to, and entreprenurial control over, information)

e.g., Bourdieu: "...social capital is the sum of the resources, actual or virtual, that accrue to an individual or group by virtue or possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition."

e.g., Coleman: "Social capital is defined by its function. It is not a single entity but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence."

Figure 2-7 - Social capital Metaphor and Network structure models (Burt, 2000)

The third model in Figure 2-7 (which is the model adopted in this research) exhibits two other mechanisms of social capital that are built on the assumption that information is not replaced but rather transmitted along the network. Hence, the question of who knows what early comes into play. Eventually, information will be transmitted to all actors, but the advantage lies in the factor of time. Closure and brokerage are mechanisms that relate to the range of the network and flow of information within it. The primary assumption here is that information flows within a group before it circulates between groups, which implies that the more closed the network, the more fluid flow of information is allowed between it. However, this also means that within a multi-group network, actors are not simultaneously aware of the opportunities in all groups (Burt, 2000). Closure and brokerage mechanisms correspond to network closure and structural holes theory respectively (Burt, 2000).

2.6.2.1. Network Closure

According to Burt (*2000, p. 351*) and Coleman (*1990, p. 310*), the closure of a network allows for two things; the first being access to information through contacts rather than through searching for it in other channels. Coleman gives an example of a person who isn't interested in reading the newspaper, but like to stay informed about certain current events, so he saves time by having a friend who is interested in current events and reads the newspapers constantly. Hence getting the information he wants from this friend while saving a lot of time and energy doing something he dislikes. The second important aspect about closure is "trust". Closure decreases the risk of untrustworthiness within the network. In this sense, norms of trust within a highly enclosed network also ensure higher social capital (Burt, 2000). Coleman illustrates that such trust built on closure is the basis of rotating-credit associations for example, which implies that without this trustworthiness among members, a person who received an early pay-out in the cycle could leave other members with loss. Thus, if closure and trust did not exist between members, these institutions would not exist in the first place. Closure is also important when it comes to building reputation (status) within a certain profession, in which case the more closed the network, the higher it means to have collective sanctions ensuring trustworthiness (Coleman, 1988, 1990).

2.6.2.2. Structural Holes

The concept of structural holes arises from "brokerage" (Burt, 2000) which gives an edge to an individual as they link weak parts of the network. As illustrated in Figure 2-6, holes in social structure, or structural holes, create a competitive advantage for an individual whose relationships span the holes. Burt (*2000*) argues that "holes are buffers, like an insulator in an electric circuit. People on either side of a structural hole circulate in different flows of information. Structural holes are thus an opportunity to broker the flow of information between people and control the projects that bring together people from opposite sides of the

hole". Circling back to the Burt's example in Figure 2-6, Although both James and Robert both have 6 connections in the network, Robert has a higher advantage (and more social capital leverage) because of his connection to different parts of the network that otherwise would not be accessible to group B in the structure. From this notion, the idea of structural holes becomes quite vital for social capital within the case study in this research, where the roles of different enterprises could surpass mere business interactions into structural hole network that strengthens the industry further in Damietta.

2.6.3. Norms

The concept of a "norm" works quite differently from the other two dimensions. A norm is "a property of the social system, no of an actor within it" (Coleman, 1990). Norms arise from collective individual actions and are usually used within sociological research to investigate and explain individual behaviour. One of the vital questions regarding norms was posed by the work of Durkheim about whether an individual's behaviour is affected by the social system in which they are (Coleman, 1990).

2.7. Operationalising Social Capital

2.7.1. Measuring Social Capital as a system

According to Coleman (Coleman, 1990), understanding the behaviour of social systems is more important than understanding the behaviour of individuals making up this system. In some specific cases, a social phenomenon can be explained as the summation of behaviour of its individuals, but this is often not true. Hence, social capital of a given community is better explained as factors that relate to the system as a unit, rather than individuals. This entails understanding the processes internal to the system, with its component parts on a lower level below that of the system, which Coleman labels as "internal analysis of system behaviour" (*Coleman, 1990*).

Explanations and interventions based on lower lever components of the systems are more stable than those at the system level. The system forms as a result of the actions of its parts, hence, knowledge of the combinations of those parts and how they produce systemic behaviour is more predictable and reliable (Coleman, 1990). Hence, understanding the system as an aggregation of small components (as discussed in section 2.3.1) becomes more tangible as well as measurable, making investigating social capital with a measurable approach attainable as a research aim.

2.7.2. Approach to Measuring Social Capital Dimensions

This research adopts **embedded single case study design** (Yin, 2014), in which the main case includes a total system, sub-units and individuals that each provide a different set of data and would dictate a separate data collection techniques to use (also visited in Chapter 4). The researcher has incorporated this methodological design developed by Yin (2014) with the earlier examined literature on factors constituting social capital (section 2.6 above), in order to identify the content of this levelled system in relation to this study. This comprises inclusion of information from Figure 2-5 (social cohesion/trust, networks and norms) (Coleman, 1988; Hunt et al., 2015b; Koivumäki, 2013; Lin, 1999; Putnam, 1995, 2002; Putnam et al., 1993) as well as the choice of unites to be characterised based on Yin's work (2014). The following Table 2-3 illustrates these levels of data in the embedded case study, where: 1. the overall system unit is the city as a spatial unit (including the locations of the population of furniture SMEs), 2. the intermediate level is data on the three components of social capital (for each enterprise), and 3. the smallest is the individual owners of enterprises (their opinions and experiences in the market and industry.

This theoretical methodological and literature mapping has informed the methodological design of this research which is discussed in details in Chapter 4. The three levels of kinds of data identified by the researcher are: **Level 1 data** (spatial city scale) is collected through the geospatial network mapping which

builds on the enterprises locals in relation to the city's urban patterns. **Level 2 data** (social capital components) is collected through a survey that targets collating a representative sample of enterprise owners in the industry. Level 3 data (individual enterprise owners) is collected through in-depth interviews that target understanding the social patterns of users.

Utilising this systematic understanding of merging theory and methodological design ensured that the case study approach tackles all the necessary aspects and that the data collection methods provide a comprehensive dataset that would support the fulfilment of the aim of this research.

Table 2-3 - Kinds of Data needed in Case study layers of divisions (developed from (Yin, 2014)

Units Being Characterised	Total System	Intermediate Units			Individuals
	Social Capital in the city's industry	Social Cohesion Survey of enterprises/ workshops	Network Density Survey of enterprises/workshops	Norms Survey of enterprises/ workshops	Interviews with owners
Enterprises / workshops	Spatial distribution (GIS data of city's furniture workshops + SMEs)	* Trust in other enterprises. * Reciprocity with other enterprises.	**Embedded Resources** * Network Resources: Range of resources, best resources, variety of resources, composition (average resources), contact resources. * Contact Statuses: Contacts' occupation, authority, sector.	* Belief in activities collegiality. * Agreeing with collective rules.	
			Network Locations * Bonds: exclusive interactions and solidarity among "people like us" that has the potential to lead to cooperation. * Bridges: inclusive solidarity among people of different backgrounds and can "traverse social gaps. * Links: account for relations that span vertical arrangements in society.		
Locals	Number of Employees in Enterprise				* Connections and network density. * Relation with employees. * Connection to outer market.

2.8. Social Capital and Geographic Imaginaries

> *"Social capital is an inherently geographical*
> *phenomenon that can be framed within constructions of*
> *socio- spatial processes and presented empirically in*
> *real-world contexts"*

(Naughton, 2014)

The reflections of space and context on narratives of social capital conceptualisations has been widely debated in literature. According to Naughton (*2013*), simplistic geographic imaginaries tend to fit within the dominant views on social capital, producing geographically reduced narratives that deprived of specificity and context (Sheppard, 2011). A notable attempt is that of Naughton (*2013*) to connect social capital concepts with geography and address economic latency on a theoretical level, trying to understand how specific communities resolve their problems by utilising resources of their social networks. This emphasises the spatial dimension of social capital, without which the narrative becomes simplistic and disconnected from real context. Although in specific cases, this might not affect the reliability of results (such as in non-geographically-specific proficiency studies), in most cases -including this research-, social capital studies relate to everyday patterns of people in a specific socio-economic setting, where geographical imaginaries are necessary in delivering a sensitive account of the socio-economy of space (Naughton, 2014).

This research adopts Naughton's argument on the significance of context-specific and context-explicit narratives of social capital, which defies the rhetoric of "social capital as a panacea that can be built from 'nothing' in any prevailing circumstances and for any desired benefit" (Naughton, 2014). Reflecting on Damietta's furniture industry, the patterns of daily life have generated a specific form of social capital networks over time, which is unique to this set of geographic and urban imaginaries for the community of Damietta. With the

changes in this set of circumstances resulting from the introduction of Damietta Furniture City megaproject (DFC) into the region, the community cannot be expected to retain its competitive advantage affiliated with social capital as before this project.

The overlap between economic and geographic discourses within the context of social capital has had major debates amongst academics concerning the representation -or lack thereof- of geography, context and space in the economic argument (Naughton, 2014). Sheppard (*2011*) illustrates methodological nationalism, methodological territorialism and methodological individualism. The first occurs when nation-state is used as measurement unit, the second relates processes to specific attributes of an area (excluding interdependencies between different scales), while the third is a generalisation of human behaviour to ideal types (Naughton, 2014) . Sheppard (*2011*) evidently acknowledges the success of the dynamic use of the three levels in a capitalist economy, which has been utilised to produce imaginaries of capitalist development towards a common scenario to a good life that suits all. However, proper geographical imaginaries are missing from this discourse (Naughton, 2014). Similar "embeddedness" (Granovetter, 1985) between sociology and economics has been debated and it is currently recognised that economics is embedded in social relations, which should inherently mean that they are embedded in socio-spatial context as well (Naughton, 2014).

2.9.　Chapter Summary

In this chapter, literature on social capital and Networks was examined. The concept of social capital and its distinction from other types of capital has been reviewed. The research also investigated social capital structures and community interactions. This chapter also included a presentation of social capital components (trust, networks and norms) with reflection on their relation to industrial contexts. The dynamics of reciprocal business actions and the

theoretical basis of actions between actions in business have been exhibited as well. Theories and perceptions on social capital and its measurements and operationalisation techniques were also investigated.

This review of literature relevant to social capital theory and implementation is the base layer upon which the theoretical and spatial framework is to be constructed in section 4.9. The overlap between the understanding of social capital, economic dynamics and the patterns of space in the city together form the tool utilised in the geospatial mapping of social capital networks for Damietta's furniture industry.

3

CHAPTER 3 – ECONOMIC CLUSTERS AND GRASSROOT ECONOMIES

3.1. Chapter Introduction

In this chapter, a comprehensive review of Grassroot Economics is presented with regard to Porter's Economic clusters (Porter, 1990) and the theoretical conceptions that relate to them such as populism, Eco-localism (Curtis, 2003) and Community Currencies. The chapter aims at illustrating the entanglement between economy, the local community and the significant vernacular economic factors that shape a different type of economy from the globalisation scene. With literature review presented in Chapter 2 on social capital, a clearer overview of the concepts studied in this research can be formulated. This would inform the design of the mapping tool (theoretical and spatial framework) in section 4.9.

3.2. Grassroot Economics and Industry

"Grass-roots Economy – We Work Together" was written on the Bangladesh Business Network (BBN) Committee vouchers (Ruddick et al., 2015), which illustrates the concept that "grassroot" signifies. Grassroot economies operate on a small scale (formal and informal), giving way to a more sustainable economic pattern that fits smaller societies (Ruddick et al., 2015). Examples of Bangladesh and Kenya have adopted projects that capitalise on small scale economies and introducing the concept of alternative currencies (Ruddick et al., 2015).

From the collective city economy perspective, Porter argues that competitive advantage is created and sustained through a highly localised process, where competitive success is a reflection of differences between competitors in culture, economic structure and history among other factors. Within the same line of thought, competitiveness of a cluster first and foremost depends on the capacity of its industry to innovate and upgrade, hence it is achieved through acts of innovation (Porter, 1990). In Damietta, the culture of spillover and local buzz is inherited through generations of residents working and exchanging knowledge on the "craft" for decades.

3.3.   Theories and Concepts

3.3.1. Competitive Advantage Theory

Porter argues that competitive advantage is created and sustained through a highly localised process, where competitive success is a reflection of differences between competitors in culture, economic structure and history, among other factors. Within the same line of thought, competitiveness of a nation first and foremost depends on the capacity of its industry to innovate and upgrade, hence it is achieved through acts of innovation.

From this notion arose the industrial competitive paradigm encouraging cluster economy in different ways. Examples of this include Sassuolo, Italy and craft-based towns in China (more information in examples in the following section 3.5), while a contemporary example of innovative clusters initiated in the modern day is Silicon Valley.

Another significant aspect of competitive advantage is its sustainability, which is, according to Barney *(1991)*, based on inimitability. This is in most cases related to the intangible resources rather than the tangible ones. This means that the process, product and characteristics of the cluster are extremely hard to replicate and cannot be acquired on the open market (Qiu et al., 2017).

Additionally, other benefits of agglomeration include knowledge spillovers and local "buzz" (Bathelt, Malmberg, and Maskell, 2004,Qiu et al., 2017) between individuals and entities, facilitating innovation within the region (Arrow, 1962,Marshall, 1890,Qiu et al., 2017,Romer, 1994).

Reflecting on Damietta's market, the inherent identity of the furniture industry and the interconnected social spatial and economic cycles between the workshops and businesses, as well as the cultural correlation between the city and the industry in the wider consumer background in Egypt; are all factors that can be highly utilised as catalysts for creating a sustainable competitive cluster based on local economies.

Figure 3-1 below identifies the forces of competitive advantage, and how interaction between these different forces affects the profitability and prices. Within the context of this research, it is most relevant to state that rivalry as defined by Porter can be damaging, particularly in price competition. Other types of rivalry such as advertising, new product introductions, R&D and increased customer service can catalyse competitiveness and develop the industry in the region/cluster (Magretta, 2012,Porter, 2008).
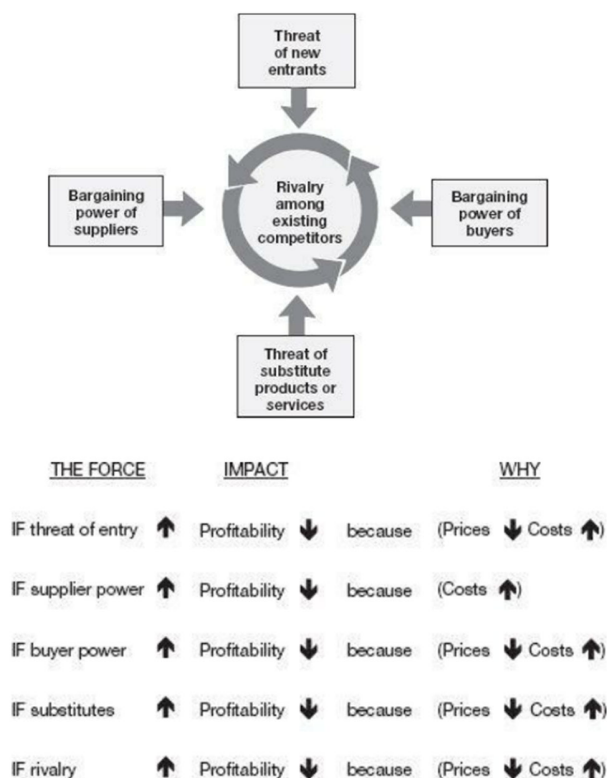
Figure 3-1 - Five forces of Industry Structure (Magretta, 2012,Porter, 2008).

3.3.2. Eco-localism

Eco-localism is an economic paradigm that builds on the notion that economic sustainability is best achieved through creating local and regional self-reliant community economies. Eco-local theory presents a novel analysis of the "economy of place" that reflects symbiotic relationships, (Curtis, 2003). Even though Eco-local economic theory overlaps immensely with ecological economics, they are distinct (Curtis, 2003). In his paper on Eco-localism Theory, Curtis (*2003*) emphasised that the theory has unique concepts and analytical propositions linking the four aspects of place, nature, society and economy. It is safe to state that Eco-localism rejects globalisation and embraces its contradictory, self-reliance.

Eco-localism economic theory presents a middle ground that encompasses both conventional economic concepts and ecological economies, capitalising on the importance of social capital to preserve natural capital (Curtis, 2003). A reflection of eco-localist measurement of economy is through Ehrlich & Holdren's *(1971)* IPAT equation analysing environmental impact of economy (I) as a product of population (P), average material standard of living (A) and resource consumption as a function of technology (T).

3.4. Industry and Cultural Production

According to Scott (*1997*, *2008, 2011)*, there is a tight link between space and cultural production, which formulates the essence of the new cultural economy of capitalism. This is specifically important regarding "cultural industries", where the production system, social environment and urban composition are merged to form the complete socio-economic setting (Allen John. Scott, 2008) driven by economic competitiveness (Porter, 2012). This can be seen in the organic continuation between different activities/commodities within the city's spaces connecting enterprises on the supply chain of an industry or production system. Examples are numerous across the globe, including New York, Paris, London and other cities, where certain districts would have place-specific economic activities linked to cultural infrastructure and the relevant industrial vocations (an example of the connections could be: shopping venues, galleries and fashion production firms) (Allen John. Scott, 2008).

Within its semi-rural setting, Damietta resembles the same cultural production socio-spatial patterns, where the city's main focus is on industrial production of furniture with the structure of the city contributing to the efficiency and connectivity between enterprises and services on this particular supply chain. This can be exhibited in the agglomeration of furniture galleries on the main road, the concentration of whole production lines in enterprises within the same street/alley, and in the social services (such as cafes) where business deals are

struck daily. The following Figure 3-2 reflects on Damietta's situation on mapped taxonomy of cultural production industries produced by Scott (*2008*). Furniture industry falls within the division of consumer-oriented craft and artisanal industries, which are in term classified according to whether the industry is organised by assembly or process methods of production.
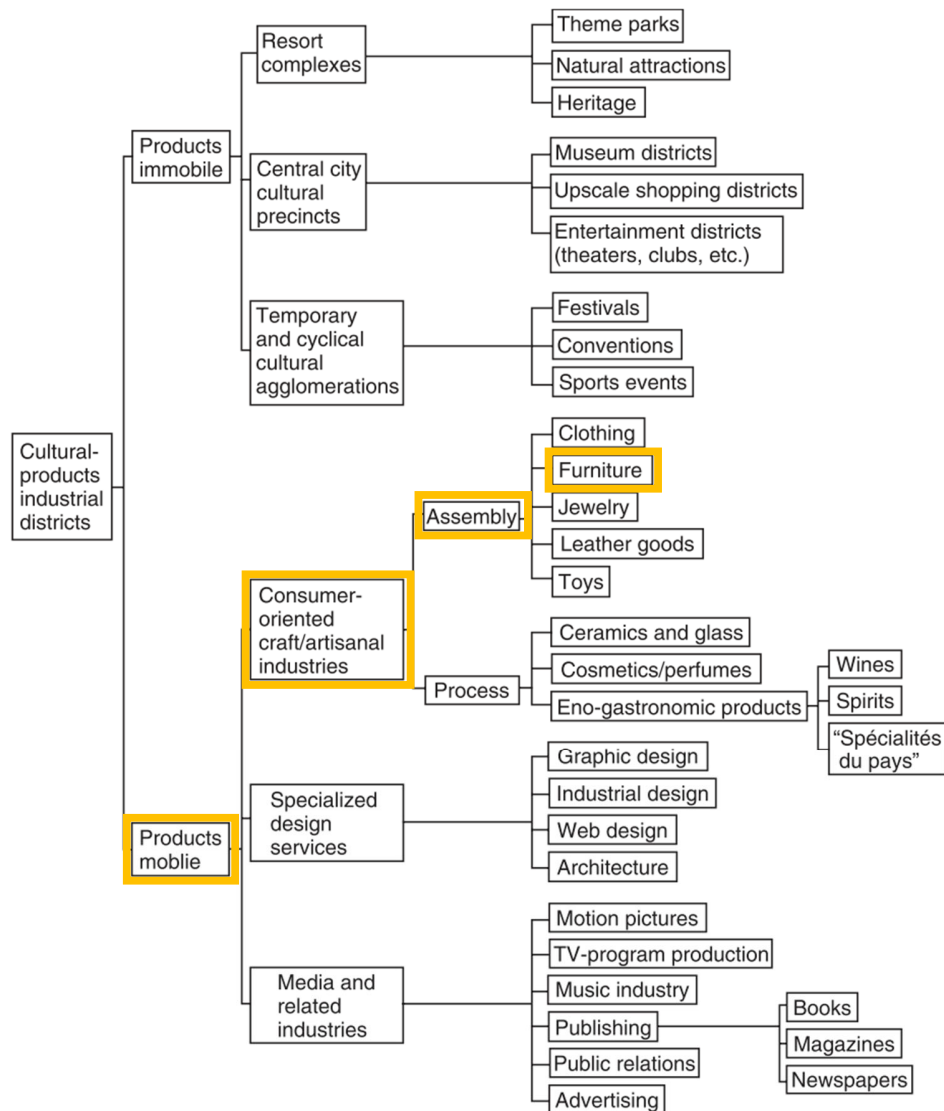
Figure 3-2 - Damietta's Furniture Industry reflected on Scott's Taxonomy of Cultural Industrial Districts (Allen John. Scott, 2008)

3.5.   Precedents of Competitive Economic Clusters

Competitiveness of cities is a rising field that has been adopted in various cities around the globe where cases in China, Italy as well as many Asian cities have been studied in literature as competitive clusters. Following Porterian Theory, urban approaches arose with methodologies and strategies that build towards local competitive economies. There are countless examples in literature of businesses and urban settings with lessons learnt regarding social capital and economic clusters (Allen J. Scott, 2008). In addition to the above mentioned examples, the list extends to; internet nosiness clusters in Tokyo (Arai et al., 2004), the making of nature films in Bristol (Bassett, Griffiths, and Smith, 2002) and Parisian recorded music industry (Calenge, 2002), among others. Within each case, the common characteristic is that the local industry/activity can be seen as a locally concentrated network comprising the small enterprises with a balanced dynamic system of interactions (Settembre Blundo et al., 2019).

Although each industrial city is different in terms of dynamics and types of interactions within its industry networks, the core nature of the relationship between the city's community and its industry exhibits many commonalities among different cases. This can be utilised and mobilised as lessons learnt from one city to another. For this reason, this research examines two examples as precedents to understand the common aspects that would help in the case study investigation in Damietta.

The first example is the famous Sassuolo in Italy, which was studied by Porter in his attempt to prove his Competitive Advantage Theory (Porter, 1990). The second city is another furniture industry-oriented context (similar to Damietta), where a very similar pattern of growth (MSMEs based) occurs in the city and region. Examining these two specific cases offer both a theoretical example that abided by the concepts of competitiveness and networking, and a pragmatic furniture-based example that would shed the light on similar on-ground

relationship between the city's spaces and the industry network and production within the furniture industry. Insights from both examples combined assisted the researcher to formulate a clearer overview of the industry and networks, informing the methodology and theoretical framework in the following Chapter 4 below.

3.5.1. Ceramic Tile Industry in Sassuolo, Italy

Sassuolo, the Italian capital of ceramic tiles industry is an established example of Competitive Advantage through economic clustering. The agglomeration of businesses in the area not only helped increase the individual growth rate of each company, but also gave the who city an advantage as a cohesive competitor rather than each company competing solely in the global market (Porter, 1990).

Sassuolo's industry dates back to the thirteenth century where crockery was the main activity and evolved into ceramic tiles after WWII. The new tile companies benefited from a domestic pool of mechanically trained workers. The area surrounding Sassuolo was also the place of origin for companies such as Ferrari, Maserati, Lamborghini, and other technically high-level companies. During the 1960s and 1970s, the tile industry prospered, more companies offering supporting services and raw materials started forming in the area, and the cluster started to be stronger and more interlinked. By the late 1980s, Italian companies led the ceramic tiles industry with almost 30% of world production being concentrated in the small town of Sassuolo. As the number of companies in the industry increased, so did the competition, resulting in fast spread of new products, technologies and innovative designs. The role of the Assopiastrelle (Italian ceramic tile industry association) was notable in this precedent, since it focused resources on Sassuolo and executed an effective marketing and export plan, spending roughly $8 million to promote Italian tiles in the United States between 1980 and 1987 (Porter, 1990).
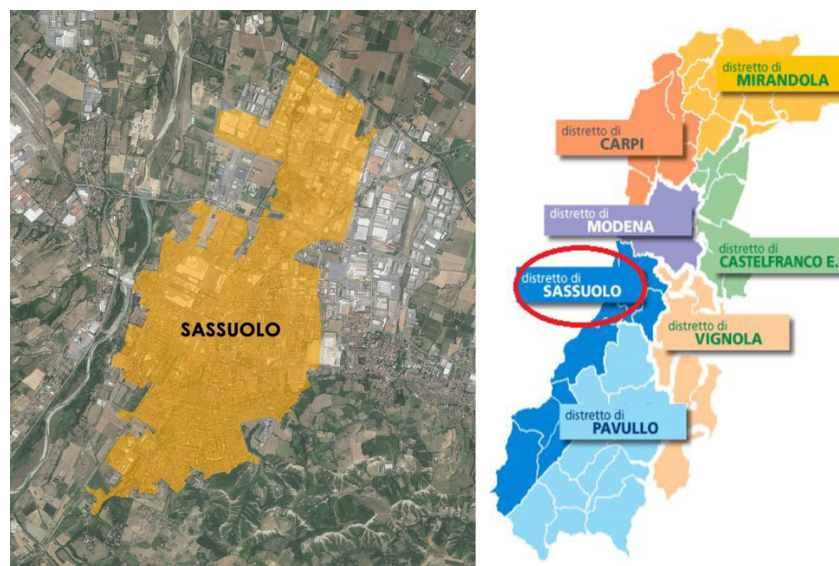
Figure 3-3 - Left: Sassuolo, Italy (source: Google maps 2018). Right: Map of Sassuolo and regional context (Mengliev, 2015).

Observing the dynamics that drive the current success of the industry in Sassuolo would relate to the production line dynamics, which comprise a cradle-to-grave procedural system including: extraction, transport and grinding of raw materials; pressing, glazing, decoration, firing and packaging of tiles; in addition to the use, maintenance and disposal of equipment (Pini et al., 2014). Examining this chain of activities and stakeholders (Figure 3-4), it is noticeable that the production chain and value chain coincide, which contributes to the success of the industry. According to Pini (2014), the production chain consists of the ceramic tiles manufacturers at the centre with upstream services (glazes, machines and raw materials) and downstream distributors and retailors. Around this production line, there is a secondary network of suppliers and collaborators supporting the process and entry of the product into the market. These processes all work together as one unit on a macro scale, and the innovation is added by the existence of multiple enterprises in each category in the city. Another aspect that makes this city's industrial network special is that much of the collaborations are established based on trust and on an informal

environment, where interactions might be carried out completely without contractual agreements.
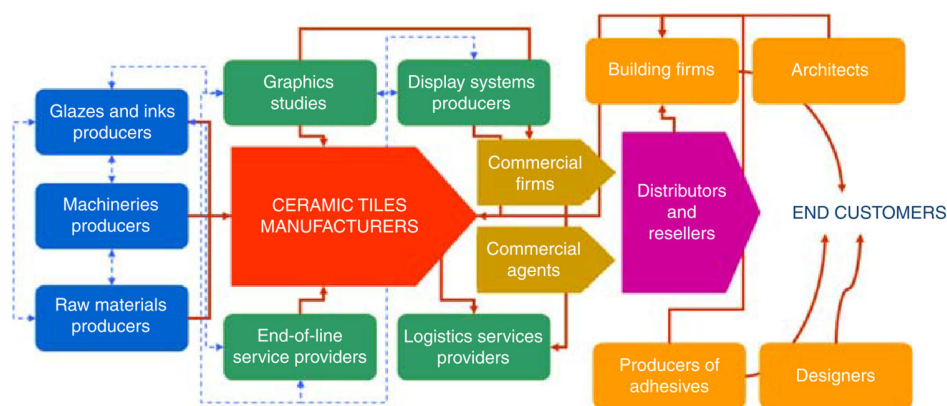
Figure 3-4 - Production Chain in Sassuolo's ceramic industry (Settembre Blundo et al., 2019)

The location and concentration of the enterprises as well as their small scale have contributed to the formation of this intertwined web of social capital network based on economic interaction between different actors along the production chain. This case provides a rather interesting example as compared to Damietta's furniture industry, where similar level of informality and long-term trust influences the market and transactions to a great extent. Hence, this research's hypothesis of the correlation between social capital network and the geographic agglomeration of same-industry enterprises has already been clearly identified and studied in this similar example that Porter introduced in his work proving the Competitive Advantage Theory (Porter, 1990)..

3.5.2. Furniture Industry in Norway

Similar to other strong economic clusters in Europe, Norway's furniture industry clusters evolved in the 1970s and 1980s, where they was based on SMEs being more competitive actors in the market than larger firms (Isaksen, 1997). The case of Norwegian economy is specifically interesting as an economy in transition. It was built on natural resources (oil, fisheries) and heavy industries

(shipbuilding), but evolved into an innovation-centred economy (Qiu et al., 2017). Furniture and interior decorating industry is the largest design industry in Norway, with about 40% of its total production exported to the international market. There is a concentration (clustering) of furniture industry in Sunnmøre and Oslo areas as identified in Figure 3-5 below.
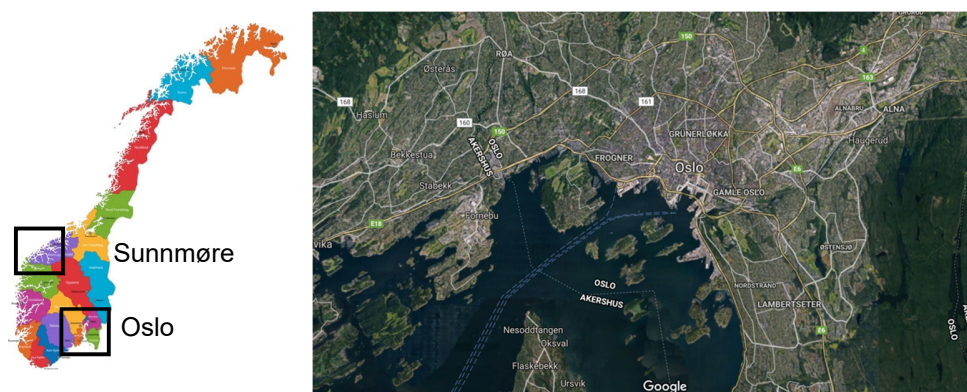
Figure 3-5 – Left: Norway's Furniture industry clusters. Right: Oslo map (Google 2021).

Examining how these two clusters work sheds some light on another clear example of competitive clusters. According to Qiu (2017), inventors in the Oslo furniture cluster show more connectedness to other clusters in Norway than to external locations, while the global connectedness of Norway's furniture industry is rising. Regarding the Sunnmøre cluster, the city has been a furniture industry cluster since the 1920s. It is worth mentioning that Oslo is the capital and largest urban area in Norway, which complements the growth of the industry; while Sunnmøre is considered as a major industrial hub even though the city is not even among the five largest urban areas in in the country (Qiu et al., 2017). This gives a clear indication that the although the size of the agglomeration could support the development of the network, it is rather the strength of the bonds and ties and number of enterprises within this industrial network that determines the rise of a powerful agglomeration. This can be comparable to Damietta, which

too is not among the biggest cities in Egypt, whereas the industry network poses a great power within the regional and national market.

Another interesting observation in this example is that leading furniture firms with great capacity for integration fall behind in their efforts to connect to local businesses as compared to smaller companies. As for design inventors, they tend to find expertise more locally than globally (Qiu et al., 2017). Reflecting back on the comparison between Oslo and Sunnmøre, the type of advantage Oslo possesses is focused on R&D and design innovation, even thought it lags behind in furniture production as compared to Sunnmøre. This also proposes the significance of both innovation in design as well as magnitude of production when it comes to excelling as a cluster in the furniture industry. For Damietta, the magnitude of production of furniture is high on a national scale (further details in section 5.4), yet the R&D is limited to large scale design companies in the city. The design and innovation in Damietta is currently craft based with knowledge in neoclassical styles (more in section 5.5.1).

3.5.3. Reflections on Research and Case Study

From the previously reviewed examples of economic clusters that have been identified as powerful industrial agglomerations with links to social capital, lessons learnt can be deduced to inform the following step of this research (methodology and tools development). Firstly, the industrial patterns, scale and interactions in the market in both Sassuolo and Norway's industries are highly similar to those in Damietta's furniture industry. This emphasising the identification of Damietta as an industrial economic cluster with social capital agglomeration (supports the hypothesis and rationale behind choice of Damietta as a case study).

Another reflection relates to the production chain integration and interlinking between different scales of actors in the market through informal trust-based interactions, which is also another highly prevalent characteristic in Damietta.

The previous research conducted on Sassuolo illustrated how this integrated system aids the sustainability and buildup of social capital within the industry, hence strengthening the cluster as a whole. This can be a lesson learnt for the development (or conservation) of existing patterns of work in Damietta that integrate different types and sizes of enterprises.

Lessons learnt from the Oslo example also includes the importance of R&D in the development of the industry on a city scale, and how this has boosted the status of Oslo as a furniture hub, even though the magnitude of production of goods in Oslo is not as high as its peer cluster in Sunnmøre. This highlights that the study needs to take into concentration the level of innovation involved in the furniture industry, and not only the size of production in the city.

These lessons learnt have been utilised into the development of the research methodology in Chapter 4 below, informing decisions such as the type of data collected, content for questions and focus points within interviews, to tackle the points analysed in this section.

3.6. Chapter Summary

In this chapter, literature on economic clusters as well as theories of competitiveness and the economic models relevant to industrial MSMEs was identified. Precedents on similar contexts of economic clusters based on craft/industry were also examined. The chapter exhibits a strong connection between the small scale of enterprises and the sense of community within business interactions. This socio-economic angle ties with the original inquiry of this research, and complements the critical review in Chapter 2 as a base for developing a well-informed tool for mapping social capital furniture industry MSMEs in Damietta.

PART 3: RESEARCH DESIGN

4

CHAPTER 4 - RESEARCH METHODOLOGY AND THEORETICAL FRAMEWORK

4.1.   Chapter Introduction

This chapter identifies the development of the research design, determined philosophical stance and methodology, starting with the research problem refinement in relation to the study site, passing through the researcher's philosophical position, explaining the supported standpoint and chosen methods for attaining the research objectives. This chapter also outlines the detailed design of the methods, sampling strategies and aspects of fieldwork design and funding. After formulating the methods and tools, this chapter introduces the theoretical and spatial framework tool designed and tested in this research to geospatially map the social capital network in Damietta. The development of the framework design as well as its validation through interviews is presented in this chapter. According to the information presented here, data collection follows as well as the investigation of Damietta context secondary data (Chapter 5). Data collection, analysis and results are outlined in following Chapter 6.

4.2.   Philosophical Stance

This research investigates social capital, which is inherently a social construction that progresses differently within various contexts. From this notion, the

philosophical position of the research was chosen to align with the nature of the research problem and fields understudy. The researcher adopts **Critical Realism** as the stance for this study, which primarily implies that the research investigates and attempts to understand the underlying structures (Saunders et al., 2016) that relate to social capital in the city of Damietta, and formulate a logical data-relevant explanation of the observable events (being the patterns of industry in Damietta in relation to the arising social capital concentrations). As a philosophical position that stands mid-ground between the detachment of positivism and prejudice of postmodernism, critical realism observes the phenomenon with the acknowledgement of objective data as well as social constructions (Reed, 2005,Saunders et al., 2016).

The **ontology** of critical realism understands reality as independent and external yet layered and structured in a manner that prevents it from being directly accessible through our observations and knowledge of it. This layered ontology (Figure 4-1) acknowledges what we see as the "empirical", which is a manifestation of the reality as we feel or sense it. The "actual" is the unseen layer underneath, which is understood through reasoning backwards from the experiences to the reality that caused them, otherwise known as retroduction (Reed, 2005,Saunders et al., 2016). The "empirical" in the case of Damietta's social capital is the observable bonds between furniture businesses in the city, as well as the spatial distribution of the city's fabric regarding the scale and physical proximity of the businesses to each other. This is only part of the underlying systems, which is the causal relationships between the physical environmental and social structure of the community going in either direction. In this sense, Critical realism fits the research study and stimulates questions of structures and systems within the context of social capital.

Figure 4-1 - Critical Realist stratified ontology (Developped from *Saunders et al., 2016*)

Epistemologically, the research adopts a "mildly subjective" approach in which **Epistemological relativism** is recognised such that social facts are a product of time and historical layering, as well as are social constructions agreed upon by the people rather than existing independently (Bhaskar, 2010,Saunders et al., 2016). Social capital comprises trust, networks and norms (Putnam, 2002b) which are socially contextual values that depend on the history, bonds and structures of a given community, hence becomes highly relevant to adopt the critical realist epistemology in this regard.

Following the middle ground subjectivist position of critical realism, the **axiology** adopted recognises knowledge that is socially conditioned yet inclusive of quantitative data. However, the researcher cannot rely only on quantitative methods since the social context would immensely influence the results. Within this axiology, different **methods** can be combined within the **retroductive perspective** (Saunders et al., 2016). The following Table 4-1 summarises the narrative of the philosophical stance taken by the researcher in this study.

Table 4-1 - Summary of Critical Realism Philosophical stance (Saunders et al., 2016)

CRITICAL REALISM			
Ontology	**Epistemology**	**Axiology**	**Typical Methods**
Stratified/layered (the empirical, the actual and the real) External independent Intransient Objective structures Causal mechanisms	Epistemological relativism Knowledge historically situated and transient Facts are social constructions Historical Causal explanation as contribution	Value-laden research Researcher acknowledges bias by world views, cultural experience and upbringing Researcher tries to minimise bias and errors Researcher is as objective as possible	Retroductive, in-depth historically situated analysis of pre-existing structures and emerging agency. Range of methods and data types to fit subject matter

Another layer is the ***Human Nature*** introduced by Burrell & Morgan *(1979)*, which is specifically important in relation to social theories research, which is specifically important in relation to social theories research. According to Burrell, the two extremes are ***determinism and volunteerism***, echoing objectivism and subjectivism respectively. At one end of the spectrum, a determinist view regards man and his activities as being totally determined by the environment in which he is situated, while on the contrary, a voluntarist view identifies man as completely independent and free-willed. As this research is concerned primarily with human patterns of activities, it is vital to state that this research takes a middle position between both views, accommodating the influence of both situational and voluntary factors in account of human activities (Burrell and Morgan, 1979).

The following diagram (Figure 4-2) illustrates the researcher's place on the different philosophical levels in parallel, highlighting an intermediary position between positivism and interpretivism, which in turn reflects on the need for both objective measurable data and subjective qualitative analysis social capital structure in Damietta.
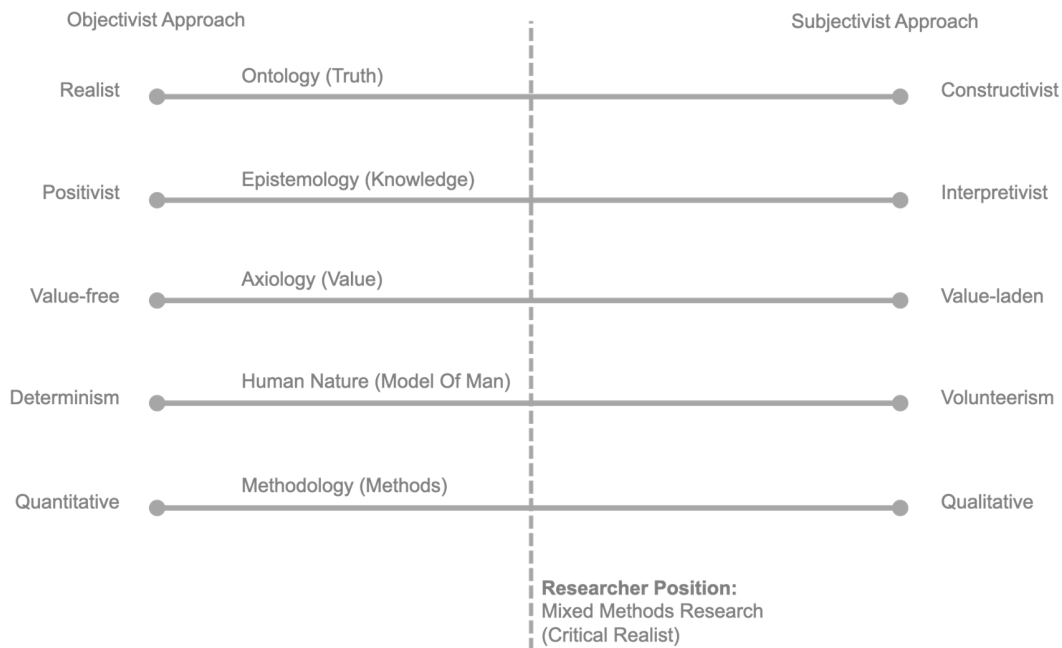
Figure 4-2 - Philosophical stance continua + Researcher's position (Burrell and Morgan, 1979,Saunders et al., 2016).

4.3.   Research Paradigm

The concept of "***paradigm***" as introduced by Burrell and Morgan (*1979*) "is a set of basic and taken-for-granted assumptions which underwrite the frame of reference, mode of theorising and ways of working in which a group operates" (Saunders et al., 2016). This becomes specifically significant to consider for social research which is directly and indirectly affected by ideological influences that govern the society under study and shape its collective behaviour. Burrell and Morgan's matrix of paradigms for approaching social theory studies the conjunction between the earlier-mentioned Subjectivism-vs-objectivism continuum in Figure 4-2 and another continuum one of a sociological ideological dimension which has Regulation-vs-Radical Change on either ends (Burrell and Morgan, 1979) (Table 4-2). The paradigms vary such that researchers working within the regulation perspective assume the cohesiveness of societal systems and structures, proposing evolution through the development of how things are

currently working rather than radically altering things. On the other end of the spectrum, researchers with radical change perspective question how things are done and pose questions of overturning the existing situation (Burrell and Morgan, 1979,Saunders et al., 2016). The following and another continuum one of a sociological ideological dimension which has Regulation-vs-Radical Change on either ends (Burrell and Morgan, 1979). The paradigms vary such that researchers working within the regulation perspective assume the cohesiveness of societal systems and structures, proposing evolution through the development of how things are currently working rather than radically altering things. On the other end of the spectrum, researchers with radical change perspective question how things are done and pose questions of overturning the existing situation (Burrell and Morgan, 1979,Saunders et al., 2016). The following Table 4-2 illustrates the values supported by each perspective.

Table 4-2 - The Regulation-vs-Radical Change Dimension (Burrell and Morgan, 1979,Saunders et al., 2016).

The regulation perspective	⇔	The radical change perspective
advocates the status quo	⇔	advocates radical change
advocates the status quo	⇔	looks for conflict
looks for consensus	⇔	questions domination
looks for integration and cohesion	⇔	looks for contradiction
seeks solidarity	⇔	seeks emancipation
sees the satisfaction of needs	⇔	sees deprivation
sees the actual	⇔	sees the potential

The intersection between the two continua results in a matrix of paradigms that reflect distinct views of the social world. As outlined in Table 4-2, these four paradigms are: Functionalist (objectivist + Regulation), Interpretivist (Subjectivist + Regulation), Radical Structuralist (Objectivist + Radical Change), and Radical Humanist (Subjectivist + Radical Change). The paradigm adopted for this research is the *Radical Structuralist* in the sense of approaching the issues under study from an analytical perspective of the organisation and structural relationships and patterns that create harmony or conflict (Saunders et al., 2016).

The researcher is attempting to understand the structural patterns within the Furniture industry society in Damietta such as hierarchies, relationships and structural domination of the market as related to social capital, which aligns with the Radical Structuralist perspective. It is worth mentioning that although this paradigm represents objectivist view, researchers adopting it differentiate themselves from extreme objectivists (Saunders et al., 2016). This also aligns with the exploratory mixed methods research approach taken in this research (Creswell and Plano Clark, 2017), which relies on quantitative data yet underpins in-depth analysis using qualitative data.
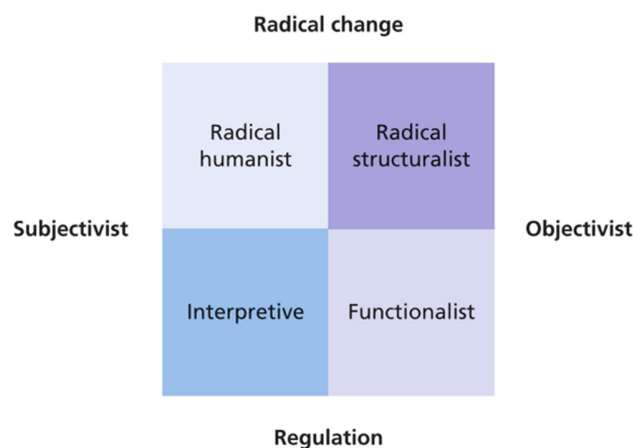
Figure 4-4 – Identifying the paradigms for organisational Analysis – research adopts Radical Structuralist stance. Source: (Saunders et al., 2016) Developed from (Burrell and Morgan, 1979).
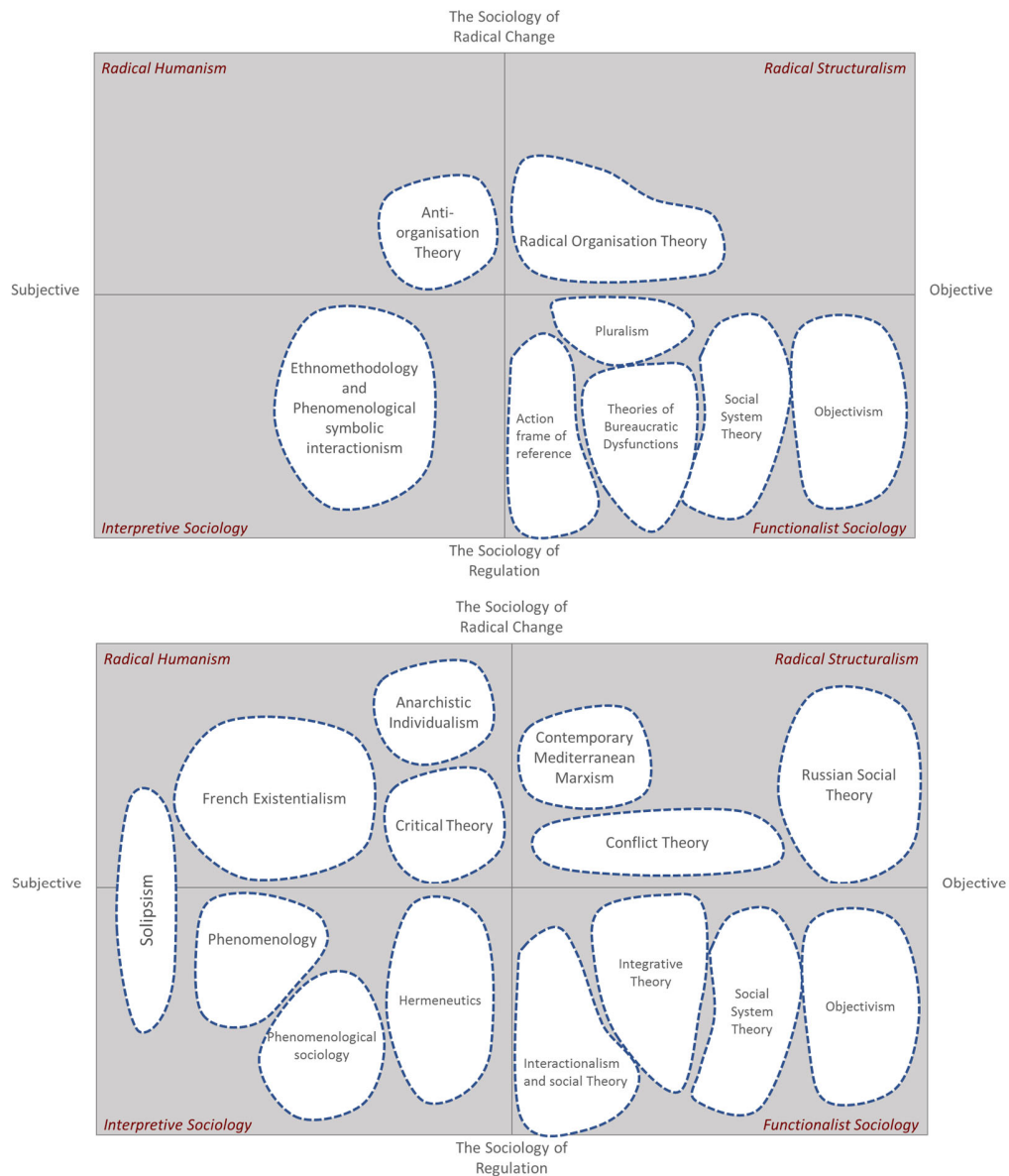
Figures 4-5- A&B – An investigation of Different Schools of Thought located in
each of the four paradigms as identified by Burrell and Morgan (1979)

Figures 4-5 A&B illustrate the different schools of thought that belong to the four
paradigms according to Burrell & Morgan (*1979*). Focusing on Radical
Structuralist paradigm, the most vital influence was by the mature work of Marx,
after his epistemological break towards Darwinian theories of evolution and in

political economy. This is in addition to the Weberian influence, which along with Marx's work formed the Conflict Theory (Burrell and Morgan, 1979). Understanding the major theories and schools of thought in the social world has benefited the research's correct positioning in terms of theory. Further depth concerning the influence of Marx and Weber on the analysis of social capital in Damietta is explored in the literature of this research.

4.4.   Methodological Choice

This research is attempting to investigate the dynamics of social capital and its relation to space and industry in Damietta – Egypt, utilising both the perspectives of users as well as the macro-scale overview of the volume and concentration of social capital. From this notion, the logical approach to theory would be *abductive*, where the research starts with a theoretical premise and hypothesis, aiming to test them (Saunders et al., 2016). The research intends to build on the existing literature and theories of social capital as a framework for understanding the dimensions of social capital, and applying this classification through data gathering and observations of the context, testing its applicability in the context under study, as well as opening generalisability of these theories for future research within similar contexts (Van Maanen, Sørensen, and Mitchell, 2007,Saunders et al., 2016).

The abovementioned approach and philosophy reflect on the methodological choice, which according to the nature of the research question, context and consequences, is a *mixed methods research design* (Creswell and Plano Clark, 2017). Qualitative data was gathered in the first phase of the data collection (semi-structured interviews), followed by quantitative data (survey and crowdsourcing map); i.e. *sequential exploratory mixed method research design* (Saunders et al., 2016). Each data collection technique is further explained in the following sections of this chapter. The qualitative data gathered in phase 1 has been utilised as a basis for the refinement of the survey design

(Shannon-baker et al., n.d.) and to gather exploratory insight on the context and participants as well as information on how to approach more participants for the survey and mapping exercises.

As mentioned in chapter 1 (Introduction to Research), the research query represents a **combined exploratory and evaluative study** (Creswell and Poth, 2018), which entails that the objective is to explore the different factors related to social capital in Damietta and evaluate/measure the volume of social capital as a reflection on spatial distribution of enterprises in the city (spatial factor).

This methodological choice allows for complementarity of qualitative meaning for social capital, as well as quantitative evidence of statistical data proving the effect of higher social capital on the city's industry. Mixed methods research also allows for triangulation technique and adds more generalisability to an otherwise singular case study, whereas the methodology of understanding social capital in this context can be duplicated in future research given the prospective area's contextual factors (Creswell and Plano Clark, 2017).
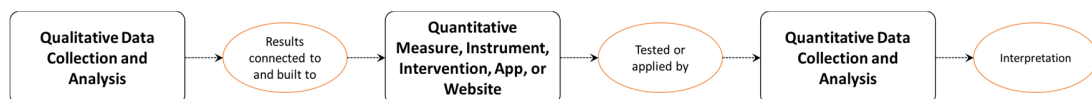
Figure 4-6 - Research Core Design (Shannon-baker et al., n.d.)

The following research design diagram (Figure 4-7) is developed by the researcher from Saunders *(2016)* and explains the researcher's philosophical position and methodological approach in this study in details.
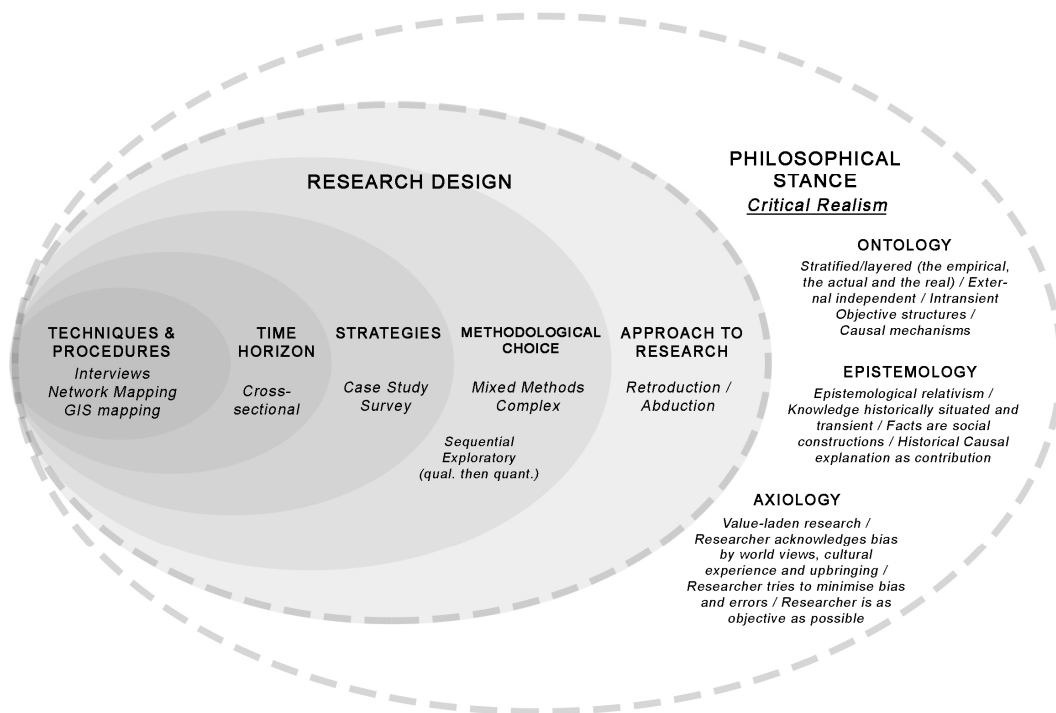
Figure 4-7 - Philosophical Stance & Research Design. Developed by researcher from *Saunders et al., 2016*.

4.5.   Research Strategy: Singular Case Study

Aligning with the purpose of the research, adopting case study strategy helps illuminate the set of variables, decisions, processes and relationships (Yin, 2014) connecting social capital to small businesses in the local industry in Damietta. The interest in a singular case study relates to the unique complexity of the phenomenon (Yin, 2014) of the connection of the earlier mentioned factors in Damietta's local furniture industry. Focusing on this case generates detailed insights on the dimensions, indicators and interactions within the framework of social capital, using intensive and in-depth investigation in the real-life context of the city (Saunders et al., 2016,Yin, 2014). This would offer a novel perspective on the domain of social capital within a spatial framework. The case of Damietta has been chosen as it fits the research problem as well as encompasses rich dynamics related to social capital, spatial distribution and economic development complexities. The concentration of a certain industry-based type of

economy in Damietta also allows for a more profound and well-defined framework to observe social capital network as related to spatial distribution. Considerations of reliability and validity are addressed through the design and control measures (Saunders et al., 2016) embedded in the research methodology (interviews for framework validation and pilot survey entries before fieldwork for tool refinement).

Even though this case implies clear boundaries and indicators, the generalisability of the framework lies in the common factors that can be found in many cities in the global south, namely; local industry concentration, small-scale (MSME-based) economic cluster, and a strong long-term social structure in the business. With contextualising examination, the proposed framework can be replicated in different context for a variety of local industries. The same concept applies for the theoretical framework, where the approach and social capital related variables and inputs would be fixed for other contexts, where updates related to the type of industry and urban patterns would be examined in order to utilise the developed tool in other cities or industry clusters.

The research involves several data collection methods: 1) an offline geospatial survey of the social capital, 2) urban observations and 3) semi-structured interviews with furniture workshop owners. The research proposes a ***cross-sectional study*** (snapshot) (Saunders et al., 2016) of the dynamics of the social capital in a Damietta city at the time of the study. This is due to the fluid nature of the social capital and the acknowledgment of the possibility of continuous change in variables and weights of the different indicators in the study. This is also related to the time constraint of this PhD which doesn't accommodate a longitudinal study that may extend for a few years to capture the changes in social capital in the city.

4.5.1. Validity and Reliability

Considerations have been placed to address and provide higher reliability and validity to the design research tools and ensure rigorous research findings. For ***internal reliability*** (Saunders et al., 2016), this has been pursued through ensuring consistency in the designed research tools and limiting biases as much as possible. For example, enumerators have been utilised in carrying out the survey (with orientation for consistency) to decrease any researcher biases throughout the survey. The researcher also designed a survey design and analysis matrix and protocol in the appendices of this work.

Survey Variables Divisions, Survey Design Variables Matrix and The Survey Design (English and Arabic) respectively) to ensure consistency throughout the tool design and execution of analysis. For **external reliability**, this was pursued through identifying the consistent and the changeable/contextual aspects of the theoretical framework and survey/mapping research tool. This allows for replication and consistency of measurements within the case study context, to inform further research based on this research. The researcher also aimed to minimise threats to reliability (Saunders et al., 2016) such as participant error, participant bias, researcher error and researcher bias through using community gatekeepers, investigating community norms and culture before fieldwork, regulating research analysis process and practising impartiality.

Measures to ensure **research validity** were taken throughout the research design, and were extended to be verified through the analysis. Within the methods design as well as framework formulation, interviews were conducted as a validation tool for the framework. Additionally, pilot survey entries were filled in during the interview phase (before survey fieldwork) for tool refinement and ensuring appropriateness of the designed tools. During analysis, **internal validity** was also established as a set of questions were statistically associated with the analytical factor or outcome of the research and reflect on the hypothesis (Saunders et al., 2016). This has been achieved within the analysis through the positive relation between social capital questions results and success and profit of the MSMEs (survey analysis in section 6.5). **External validity** was addressed through taking measures to ensure generalisability of the results. This was done through calculating and targeting a representative sample of the furniture industry community in Damietta for the survey as well as through the above-mentioned identification of consistent versus contextual parts of the research design. The results of this research would be representative of the Furniture industry MSMEs in Damietta city, and replicable for similar urban settings with a single industrial economic base similar to furniture for Damietta.

4.6. Research Methods and techniques

Data collection methods have been selected according to the aim and objectives of the research, as well as pragmatic considerations such as the timeframe of the research, the nature of the field understudy, the availability and access to data and the sociocultural setting of the community in the study area (Saunders et al., 2016). The research was carried out through a single case study, including semi-structured interviews and field survey for geospatial data of social capital. Each strategy is discussed in further detail below.

Table 4-3 below shows the reflection between research objectives and methods used to fulfil them. Literature review, semi-structured interviews and systematic observations were utilised to document and understand the supply chain of the furniture industry, as well as inform the survey design. The survey was used to gather data on social capital network and concentrations in Damietta. The geospatial mapping of this data helped quantify the networks and map them as a layer over the spatial fabric of the city. Finally, the combined results of the previous methods were utilised along with analysis of successful precedents to propose recommendations for development for furniture industry in Damietta.

The exploratory component within the objectives is answered through the overlap between literature and semi-structured interviews and observations. The evaluative component is addressed through the survey and GIS network mapping. The final objective (4) is met through the analysis and understanding of the triangulated results from all the earlier-mentioned methods.

Table 4-3 - Research Objectives overlaid on Chosen Research Strategies/Methods

Research objectives	Methods and Fieldwork design
Survey and document the supply chain for furniture industry grassroot economies in Damietta city.	Examine and overlay literature on furniture industry supply chain with first phase of the fieldwork, which is in depth interviews with workshop owners (semi-structured interviews + observations).

Develop a spatial mapping framework to measure the extent of complexity of Furniture Industry in Damietta (network, social and urban mapping).	Study literature on relevant theories studied (including Social Capital, Competitive Advantage and Network Theory) and develop spatial framework based on them. Identify variables to be measured according to theory (Literature).
Quantify and measure Social Capital networks of furniture industry in Damietta.	A survey to be executed and mapped on GIS for network analysis. The survey design to be completed based on the variables identified earlier and tested during the first phase of fieldwork (interviews), where interviewees are asked to fill in the survey and provide feedback for verification of adequacy.
Propose policy recommendations for the conservation and development of the economic local identity of furniture industry in Damietta.	Based on results from previous methods and techniques, as it relies on the results and values that arise from the GIS mapping and analysis. This overlaps with the successful precedents examined in the literature as a lens for possible development directions.

The fieldwork was carried out on two phases (preceded by literature review) where the first phase included exploratory qualitative inquiry of the context and community, followed by quantitative inquiry represented by survey and network mapping (Table 4-3). In between the two phases of the research fieldwork, reflections on conceptual and spatial framework were developed, which increases the contextuality of the research in relation to the furniture industry in Damietta. The following subsections investigate each method in further detail.
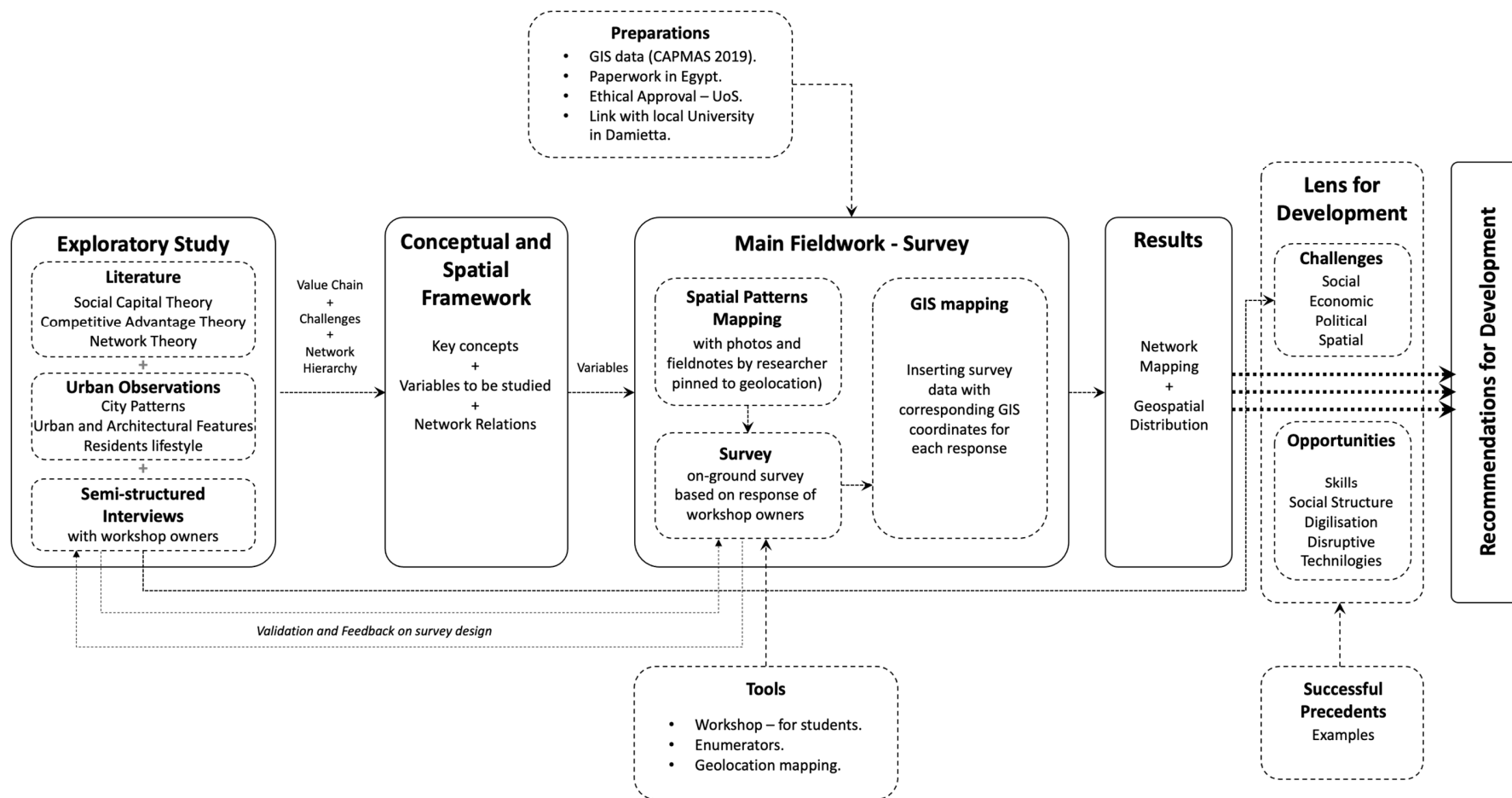
Figure 4-8 - Fieldwork Methodology Plan

4.6.1. Literature review

The core topics under study (social capital) has been described in literature through various theories (Coleman, 1988,Lin, 2003,Putnam, 2002b, 2002a,Putnam et al., 1993), it is important to review the different theoretical developments in the domain of social capital studies, in order to formulate a contextually suitable framework for Damietta city. Literature investigated intertwinned with insights on Network Theory, Grassroot Economies and Competitive Advantage Theory. Hence, the literature review was conducted, taking into consideration the primary, secondary and tertiary sources in literature, to spot the developments and gaps in research as well as concentration (or lack thereof) towards the topic under study. Another layer would be exploring the nature, dimensions and indicators of social capital, as well as the supply chain for the furniture industry in general and within the context of Damietta. This helped evaluate the connections between the two. The third and vital layer would be to analyse valuation methodologies and previous research in calculating social capital and reviewing the applicability of such methods with context-driven techniques in Damietta. This should take into consideration the degree of accuracy and allowable estimation measurements, and whether such estimations might affect the reliability or validity of research results. This phase along with the following phase were utilized to create the framework which was applied on the case study.

4.6.2. Phase 1-A: Semi-structured interviews

The first phase of the fieldwork helped the researcher in investigating and understanding the study context (urban and social), which reflects on the exploratory and evaluative nature of this research (Saunders et al., 2016). The interviews acted as an exploratory study to get familiarised with a rather enclosed community of the small city of Damietta, in terms of accessibility (Yin, 2014) to the physical space, to engage participants and to approach enterprises. Secondly, the interviews were utilised as a test of the viability of the proposed

framework and survey design to be executed in the second phase. The selected participants were given a copy of the preliminary survey design to test the topics and subtopics extracted from Putnam's theory in relation to the socially acceptable semantics and cultural expectations (Saunders et al., 2016,Yin, 2014). For example, the measure of a business's financial success is a delicate issue to ask in order to get viable answers (where participants would not resort to misleading answers). Interviews helped in understanding what the participants in Damietta would feel comfortable sharing about their finances without rejecting the questions. Thirdly, the interviews helped the researcher understand the informal physical boundaries of the concentrations of furniture businesses in the city, hence informing the study boundaries for the mapping exercise in the second phase of data collection. It is also important to mention that the interviews established personal contacts within the city (Saunders et al., 2016), which is a vital factor in carrying out the following phase of the research.

According to Creswell and Plano Clark (2017), the qualitative strand of the research would also contribute towards developing an outcome measure as well as developing an intervention. This took place through including open-ended questions about the challenges that face Damietta city's furniture industry. Hence this data was used as a final filter to evaluate the current situation of the industry from a point of view of social capital and produce recommendations for a grassroot-based development direction for Damietta.

This phase of the study comprised 7 semi-structured Interviews that were conducted with a sample of business owners of furniture industry workshops in Old and New Damietta cities, on two levels, namely, large-scale factories/workshops and micro-scale workshops. Participants were residents of New and Old Damietta, all born and raised in the governorate (whether in the city or small surrounding towns). The interviews primarily targeted issues in the social cohesion, network density and norms (as the main measured variables from Putnam's Social Capital Theory). Other themes have been discussed as

well including current socio-economic situation in Damietta and the drawbacks of the new megaproject taking place currently outside the boarders of the city (Damietta Furniture City / DFC). The interview consisted of 3 parts.

Part 1: Interview questions (30 min):

- Discussion on participant's work and how his/her occupation relates to other occupations in industry in the city.
- Discussion on participant's work environment, work relations and connections he/she has with colleagues or peers in other businesses.
- Discussion on whether family and work networks overlap.
- Discuss challenges that might be facing the industry or the participant at work.

Part 2: Mapping (10 min):

- Pointing on a map of Damietta significant locations to the participant, including his/her workshop, locations of workshops/enterprises they work with, and whether they have neighbours and family in the area working in furniture industry.

Part 3: Draft Questionnaire (10 min):

- Filling out a draft questionnaire (for the second phase of data collection) and giving feedback about their experience filling out the questionnaire for survey refinement.
- Discussion and feedback on considerations in the theoretical framework.

This phase also included secondary data collection of GIS maps and data on population and land use from official organisations (GOPP and CAPMAS in Cairo, Egypt), and finalising security clearances and official approvals needed before the commencement of the survey in phase 2. The analysis of the interview data included thematic analysis and narrative analysis using NVivo software. The latter tool aided the manifestation of context and socio-spatial

narrative into the socio-economic debate about social capital, hence challenging free-market-capitalism discourse (Naughton, 2014) that is argued to be the case in Damietta. The narratives however cannot be separated from the author/researcher (Boje and Rosile, 2002), which is a bias that the researcher tried to minimise during the analysis through crossing the narratives with the thematic (un-biased literature based) analysis.

4.6.2.1. Overcoming Data Quality Issues

Before diving into the data analysis to interview content, it is vital to mention that this research took into considerations issues that might compromise data quality, with focus on reliability, forms of bias, cultural differences, generalisability and validity (Saunders et al., 2016). Measure to overcome such issues have been taken.

Reliability issues have been mitigated through a rigorous design of the interview questions, ensuring the researcher provides sufficient level of detail that would show the findings are reliable. **Interviewee and Interviewer biases** have been mitigated through making sure the design and execution of the interviews were pre-planned to address bias. These included developing relevant interview themes, supplying a unified set of information to all interviewees prior to interview, choice of appropriate interview location (interviewee's workshop/enterprise), and unifying a pre-planned approach to asking questions in a similar way (task done by interviewer). To ensure **cultural differences** are accounted for, the researcher reflected on the nature of relationship with interviewees to make conscious choices about the appropriate cultural customs during the interviews and how to build a rapport with interviewees through an appropriate level of formality, engagement, dress code, and props between questions. Addressing **generalisability** was through utilising the interviews to test the theoretical framework formulated from theories and literature. Hence this ensures that the findings have a broader theoretical significance than a single or small number of cases of interviewees. Issues with validity have been addressed through using

illustrative questions, probing meanings and exploring responses from different angles (Saunders et al., 2016).

4.6.3. Phase 1-B: Urban Observations

The spatial patterns and characteristics of the built environment in the city of Damietta cannot be separated from the socioeconomic context understudy in this research. Hence, it was vital to include observations of the different patterns of living of the residents as related to the furniture industry, thus helping the researcher "capture life in the city" (Moore et al., 2008), and relate the socioeconomic relations to the on-ground dimension of the lifestyle of the residents.

To capture the essence of built environment, the researcher combined the interviews data with photo observations of different typologies of industry-related buildings in Damietta. Photos targeted a geographic representation as well as typological one. Geographically, photos were taken in three main urban areas representing the major urban fabric patterns in the city, namely; 1) compact organic urban areas in the centre of the city, 2) less compact areas on the periphery of the city with more relation to the entrance main roads to the city, and 3) waterfront area directly related to the Nile and crossing to the other side of the city (highlighted in the map in Figure 4-9 below). Regarding typology, the researcher targeted missed use and commercial buildings with at least the ground floor exhibiting the function of a furniture industry workshop. All the typologies that existed within the three earlier-mentioned areas were added to the observations. The photos taken can be found in the results 6.1 on page 137.
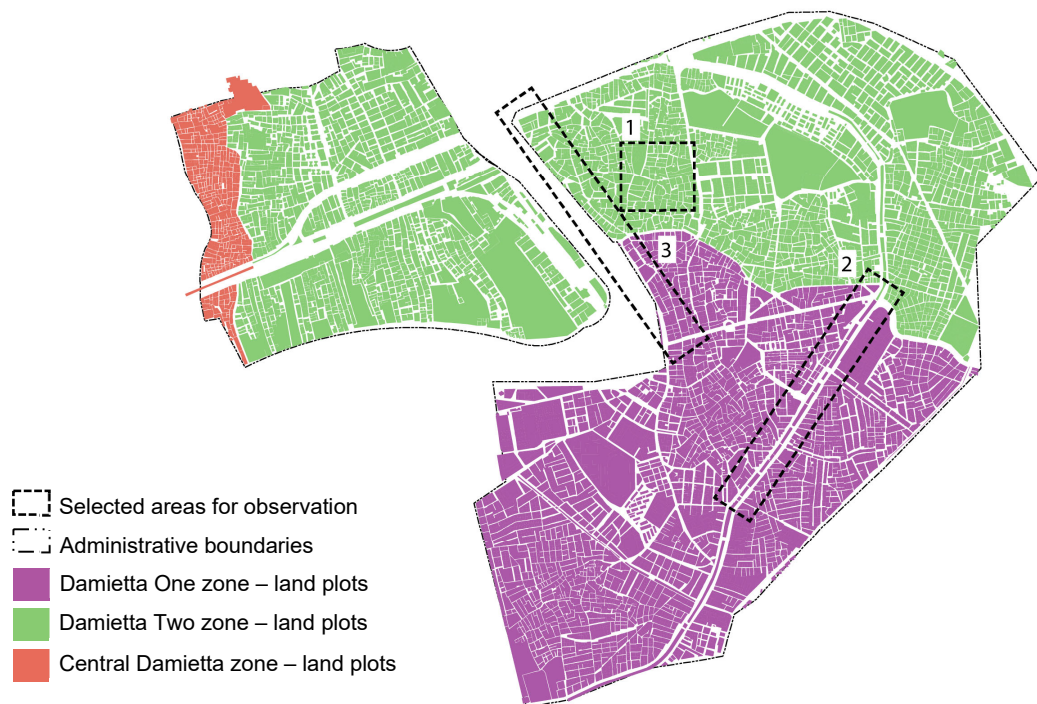
Figure 4-9 - Selected areas for urban observations (within administrative zones in the city centre)

4.6.4. Phase 2: Survey & Geospatial Mapping

Following was the quantitative primary data gathering through a survey of enterprises (filled in by each enterprise's owner (who is usually main worker in SMEs). The survey measured; (1) the dimensions of social capital (explained in Table 2-3), (2) data on employees and size of enterprise, and (3) the spatial locations of enterprises and relation to each other (network). These were through dividing the survey into 2 question-based sections, and a third section which involves pointing the locations on the map.

Table 4-4 - Economic Activities according to Furniture industry Supply chain (ILO, 2016)

Stage in the Supply chain	Activities		Work Categories (quotas)
Design		1	Design
Inbound		2	Purchasing
		3	Inbound logistics
Manufacturing	Manufacturing	4	Cutting and Carpentry
		5	Carving
		6	Veneering
		7	Finishing (staining, polishing etc.)
		8	Upholstery
	Assembly	9	Assembly
	Testing	10	Testing
Outbound		11	Value added services
		12	Packaging
Marketing, Sales and Distribution		13	Marketing
		14	Distribution and Sales (wholesalers, retailers, contract buyers and showrooms).
Services and support		15	Transportation
		16	After sales support

4.6.4.1. *Survey Sampling*

The population for this survey included all enterprises in the city boundary (identified on the GIS map) that undertake any of the economic activities listed in the above Table 4-4 (activities along the furniture industry supply chain). The chosen population of enterprises were all on the ground floor (directly related to the street network of the city) and owned by a resident of the city.

To calculate the sample for this research, there were two sources of information and constraints that needed to be taken into consideration. The first was the GIS map allocating the boarders of the study area and highlighting all the buildings in the it. This map would have been sufficient to calculate the sample if it included defined data about the workshops and their types for each building (land use). However, the only available land use data on the map was general mix-use typology and commercial typology (see map in Figure 4-10 below). This rendered the information from this point incomplete, since both mixed-use and

commercial could include furniture workshop as well as other commodities such as a pharmacy, restaurant or supermarket. The number of buildings from each typology was calculated from the GIS data (Table 4-5). For this reason, another data source had to be utilised in order to identify the expected percentages of the workshops within this population of buildings, hence the use of the second source; statistical data about Damietta governorate from census data and relevant reports (CAPMAS, 2019b,ILO, 2016) – as justified below.
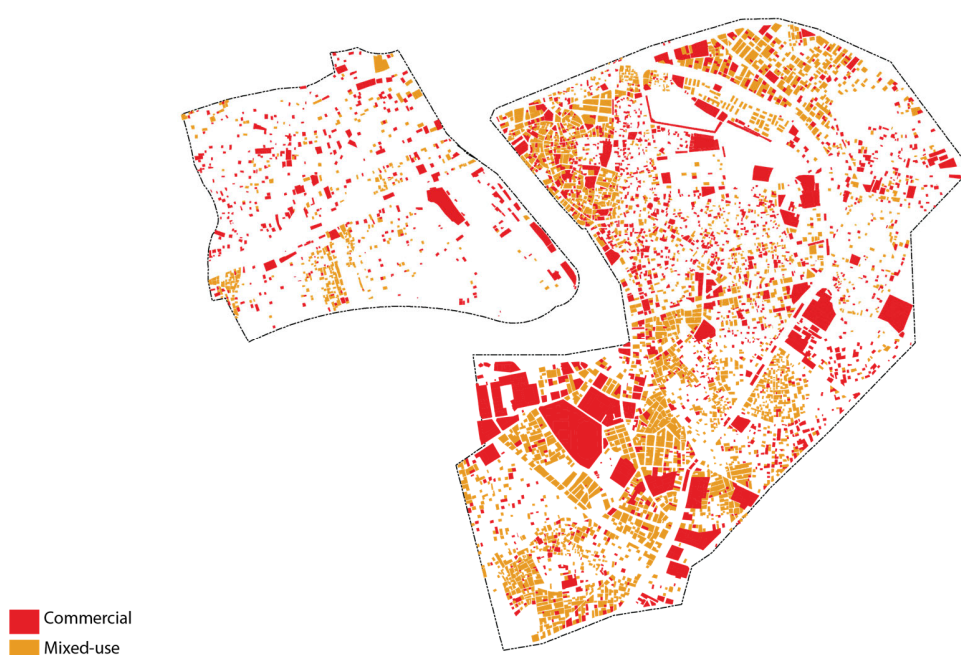
Figure 4-10 - Land use map showing only mixed-use and commercial buildings (the study population) (CAPMAS, 2019b)

Table 4-5 - Number of buildings in the study area within the relevant typologies (mixed-use and commercial) (Developed by researcher from GIS map, source: *CAPMAS, 2019*)

Typology	Number of Buildings
Mixed-use	5393
Commercial	3633
Total	9026

According to census data 2013, 30% of all employed persons in Damietta work in the industry and Damietta also accounts for 22% of furniture establishments

in Egypt (ILO, 2016). From this information paired with census 2017 data stating that the Damietta has 429,700 employed persons (CAPMAS, 2019c), we can deduce an estimate of the number of establishments working in the furniture industry in Damietta as below:

Table 4-6 - Number of Enterprises and Employed Persons in Damietta based on census data (*CAPMAS, 2019*; *ILO, 2016 from Census Data 2013*)

Unit Scale	Total Number of employed persons	Number of employed persons in Furniture industry	Number of Furniture Enterprises
Egypt	26,001,600 **	270,222 *	104,250 *
Damietta	429,700 **	128,910 *** (30% of total in Damietta)	22,935 *** (22% of total Furniture Enterprises)

*	Data from census 2013.
**	Data from census 2017.
***	Estimated number from ratio/ percentage from statistical data.

Table 4-7 - Distribution of Enterprises in furniture industry as MSMEs categories in Egypt (*CAPMAS, 2019*; *ILO, 2016 from Census Data 2013*)

Year	Unit scale	Total number of employed persons in furniture industry	Total number of furniture enterprises	Number of enterprises according to employee				
				Less than 5 employees	5-9 employees	10-24 employees	25-49 employees	50+ employees
2013	Egypt	270,222 *	104,250 *	98,728 *	5,006 *	369 *	56 *	91 *
			100%	94,7%	4.8%	0.35%	0.053%	0.087%
2013	Damietta	128.910 ***	22,935 ***					
2019	Study Area		6,343 (+)	6,006	304	22	3	5

*	Data from census 2013.
**	Data from census 2017.
***	Estimated number from ratio/percentage from statistical data.
+	From GIS map count, with assumption that 70% of commercial enterprises in Damietta work in furniture industry.

According to the estimated furniture industry enterprises size division in Table 4-6 - Number of Enterprises and Employed Persons in Damietta based on census data), the population of furniture industry enterprises in the study area can be deduced from the assumption that 70% of all commercial enterprises in Damietta work in the industry. Hence the total population would be 6,343 enterprises. From the census data 2013, the divisions of size categories of the

different enterprises were taken as guiding percentages, thus informing the number of enterprises within the research study area. In order to achieve 95% confidence level results with 5% margin of error (Saunders et al., 2016), the needed sample should be calculated as below (Saunders et al., 2016):

$$n = \rho\% \times q\% \times \left(\frac{z}{e\%}\right)^2$$

$$n = 70 \times 30 \times \left(\frac{1.96}{5}\right)^2 = 322$$

n minimum sample size required
$\rho\%$ percentage belonging to the specified category
$q\%$ percentage not belonging to the specified category
z z value corresponding to the level of confidence required (95%)
$e\%$ margin of error required (5%)

Since the target population was less than 10k, a smaller sample could be taken without affecting accuracy (Saunders et al., 2016), otherwise known as adjusted minimum sample size, calculated as follows (Saunders et al., 2016):

$$n' = \frac{n}{1 + \frac{n}{N}} = \frac{322}{1 + \frac{322}{6343}} = 306$$

n' adjusted minimum sample size
n minimum sample size (calculated above)
N total population

Thus, the adjusted minimum sample size was 306 enterprises within the study area. The sampling frame was divided into **5 categories** according to the size of enterprise (0-4 employees, 5-9, 10-24, 24-49, and 50+) (International Labour Organization (ILO), 2016, from Census Data 2013). The sampling strategy adopted was **stratified random sampling** (Saunders et al., 2016). The choice was made according to an examination of the characteristics of the sampling frame, generalisation needed, geographic concentration and relevant strata as shown in the figure below. The strata divisions and sample sizes for each stratum

were decided according to two stratification variables, which are: size of enterprise and type of economic activity within the furniture industry supply chain. The calculations are shown in Table 4-8. The stratified sample was chosen using simple random sampling across the strata from the existing GIS map contents. It is also important to mention that further clarification needed to be identified on the ground once the survey went ahead, accounting for any 'surprises' that might have occured in the process. This relateed to the calculations relying on census data from 2013 and 2017, which might have changed over the following period of time leading up to the survey execution in 2019.
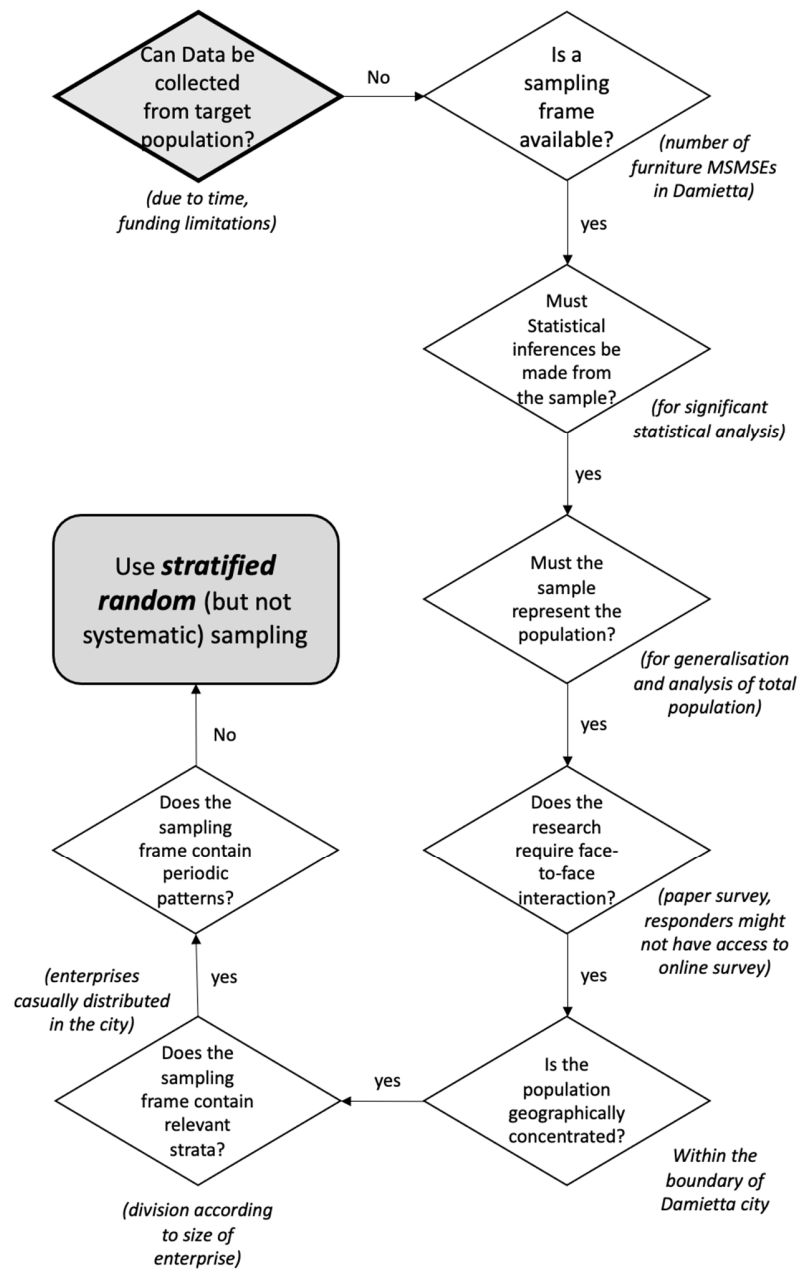
Figure 4-11 - examination of sampling frame and population characteristics for sampling strategy choice (Saunders et al., 2016).

From the previous data and calculations, sample divisions on strata were identified as follows in Table 4-8. The sample aimed primarily to map equal divisions of activities, however, this was part of the exploration process as there

was no prior data that indicates whether the activities take place equally on ground or not.

Table 4-8 - Sample Size with strata divisions (Calculated by author from above data)

				Total number of enterprises	Strata (Categories)				
					Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
Target Population in study area				6,343	6,006	304	22	3	5
					94,7%	4.8%	0.35%	0.053%	0.087%
Calculated Minimum Sample Size				306	289	14	1	1	1
Furniture Industry Strata									
All in house enterprise							1	1	1
Design	Design	1	Design		18				
Inbound	Inbound	2	Purchasing		18				
		3	Inbound logistics		18				
Manufacturing	Manufacturing	4	Cutting and Carpentry		19	2			
		5	Carving		18	2			
		6	Veneering		18	2			
		7	Finishing (staining, polishing etc.)		18				
	Assembly	8	Upholstery		18	2			
		9	Assembly		18	2			
	Testing	10	Testing		18				
Outbound	Outbound	11	Value added services		18				
		12	Packaging		18	1			
Marketing, Sales and Distribution	Marketing, Sales and Distribution	13	Marketing		18				
		14	Distribution and Sales (wholesalers, retailers, contract buyers and showrooms).		18	2			
Services and support	Services and support	15	Transportation		18	1			
		16	After sales support		18				
Total Sample Size				306	289	14	1	1	1

4.6.4.2. Survey Design

This research survey was designed to measure social capital variables (trust, networks and norms) identified in the theoretical framework (explained in detail in 4.9 below), which have been identified from literature and interviews with local MSMEs in Damietta. Each question responded to a variable, where all variables contributed to ensuring a survey matrix was fully answered through the designed questions. The questions designs, survey matrix and variables investigation are detailed the appendices section at the end of this document. The survey design

included geolocation related questions to allow for GIS mapping to follow survey and to pinpoint the entries answers to the maps.

4.6.4.3. Survey Logistics and Analysis

Participants were a sample of business owners of furniture industry workshops in Damietta. Participants were also residents of the city (preferably long-term residents). The unit of analysis was the enterprise/workshop.

Enumerators were required to achieve the target sample. The enumerators were divided according to quotas and face-to-face survey entries are required. Training prior to executing the fieldwork, orientation was given to enumerators by the researcher to ensure consistency in data collection techniques applied. The survey was paper based with printed map to project relative locations on the map. Enumerators also had access to GPS (through smartphones) in order to pinpoint locations and write coordinates on map.

Survey entries took place at the workspace of the participant as the enumerators passed by the enterprises according to a GIS map that they were provided with. Reference to the coded location of each enterprise on the map was crucial for the following part of the survey, which was the GIS mapping.

After the data collection phase was complete, the paper surveys were added to a computer-based dataset by the researcher for analysis. The analysis included descriptive and in-depth statistical analysis of the survey questions using SPSS software.

4.6.4.4. Participant Recruitment

The main technique for approaching participants was through face-to-face interaction at their workspace, since the target population was ground-floor workshops and companies publicly accessed upon the invitation of owner.

The researcher also attempted to create deeper contact with workshop owners during interviews. This facilitated the accessibility to the community through being social within the confidence of trusted community/industry members.

4.6.4.5. *GIS Mapping*

Part of the survey pointsed on the map the location of participant's workshop as well as others they worked with. The GIS datasets design is explained in further detail in a separate appendix. The locations of each survey entry and related locations were inputted on GIS map and spatial analysis. The used software for geospatial mapping in this research was ArcGIS Pro.

4.7. Analysis Of Results

The following were the primary planned layers of analysis,:

- Content and interpretive analysis of interview data (NVivo).
- Qualitative interpretation of urban observations.
- Spatial and statistical analysis of abundance and relations between different quotas (ArcGIS Pro).
- Spatial and statistical analysis of social relations between quotas (SPSS + ArcGIS Pro).
- Social Network Analysis of respondents and their networks (ArcGIS Pro).
- GIS mapping of Social Capital Networks and survey results (ArcGIS Pro).

Finally, analysis was done to conclude development strategies and recommendations that optimize the current socioeconomic assets in Damietta and ensure sustainable development path for the city based on local economies.

4.8. Ethical Considerations

4.8.1. Dealing with Confidentiality/Anonymity

All collected information during the course of the research were kept strictly confidential, and any information which might leave the university had participant

name and address removed so that the data could not be recognised. Participant data was collected on paper through the interview/survey and through the videotaping/audiotaping. Participants' identities were coded before use, hence keeping their identities safe. The data, transcripts and recordings were kept private on password protected university machine accessed only by researcher. Participant data was used for analysis of the researcher's doctoral thesis, and in other publications by the researcher. Access to identifiable data was limited to the researcher, supervisor, and potentially funding organisations.

4.8.2. Obtaining Consent

A package was printed including information sheet, invitation and survey material in order to make sure each participant had the chance to read all information, and sign before participating in the study.

4.8.3. Addressing Data Protection Issues

The followed procedure strictly kept the participants' identities hidden, since all names and addresses were coded before use. The data, transcripts and recordings were kept private on password protected university machine accessed only by researcher. In case of any data leakage, the university would be notified and measures to retrieve the data would be taken.

4.9. – Theoretical and Spatial Framework

In this section, the research synthesised the previous critical review of literature in Chapter 2 and Chapter 3, in addition to reflections on the investigated secondary data about the case study and context in Chapter 5 below. The target was to formulate a comprehensive theoretical and spatial framework to be utilised in mapping social capital in Damietta's furniture industry MSMEs. The framework as verified through interviews with MSME owners to test applicability and inclusion of all relevant variables.

4.9.1. Theoretical and Spatial Framework Design

The theoretical and spatial framework presented in this research offers a collation of spatial and non-spatial themes extrapolated from literature and relevant to the context of Damietta's furniture industry and urban patterns. These include variables related to four categories of **social capital, status in the market, spatial network mapping** in addition to **control variables** for identification of unit of analysis. Within each of these categories, variables have been identified to form the basis for the survey design. There is also a hierarchal categorisation of the themes and variables with sub-categories identified for each of the four categories to ensure that the survey and mapping respond to the original inquiry in the research (section 1.2) and reflect on the hypothesis stated earlier in the first chapter (section 1.6) on the correlation between the prevalence of social capital and the spatial proximity and compact distribution of the furniture MSMEs in Damietta. An illustration of the framework design is explained in Figure 4-13 below. The variables have been laid according to their types (dependent, independent and control variables) and their contribution to the research questions and aim. The following sections illustrate this spatial framework and the justification for inclusion of the different variables towards the final outputs.

The connections between theories and the framework are also highlighted in Figure 4-12 below and are in line with the theoretical underpinnings examined in the first chapter of this research. The first and most important connection is that to **Social Capital Theory** building on the works of Putnam (2002., 1993), Coleman (1988, 1990), Lin (1999, 2003), Bourdieu (1986), Hunt (Hunt et al., 2015) and Burt (Burt, 1992, 2015). The measured variables have been designed to include aspects on the main dimensions of social capital; social cohesion (trust), networks and norms. There are also subcategories within the theory, including for example reciprocity as part of social cohesion and contact status as part of networks (complete list of variables and categories are listed below in

section 4.9.2). The second theory contributing to the framework is **Competitive Advantage theory** (Porter, 1990) where aspects of the competitive characteristics of each enterprise are mapped in order to compare the individual as well as collective competitiveness between enterprises. The integration of **Network Theory** is a significant addition to this framework. The included variables that construct the spatial mapping (location) can be linked to the other social capital variables. This link between social capital and space is done through such integration of spatial and non-spatial variables. It is worth mentioning that the **unit of analysis is 'the enterprise' (workshop or factory),** which allows for the link between spatial distribution of the workshops and the responses for survey entries regarding non-spatial variables (such as trust, norms profitability, and others).
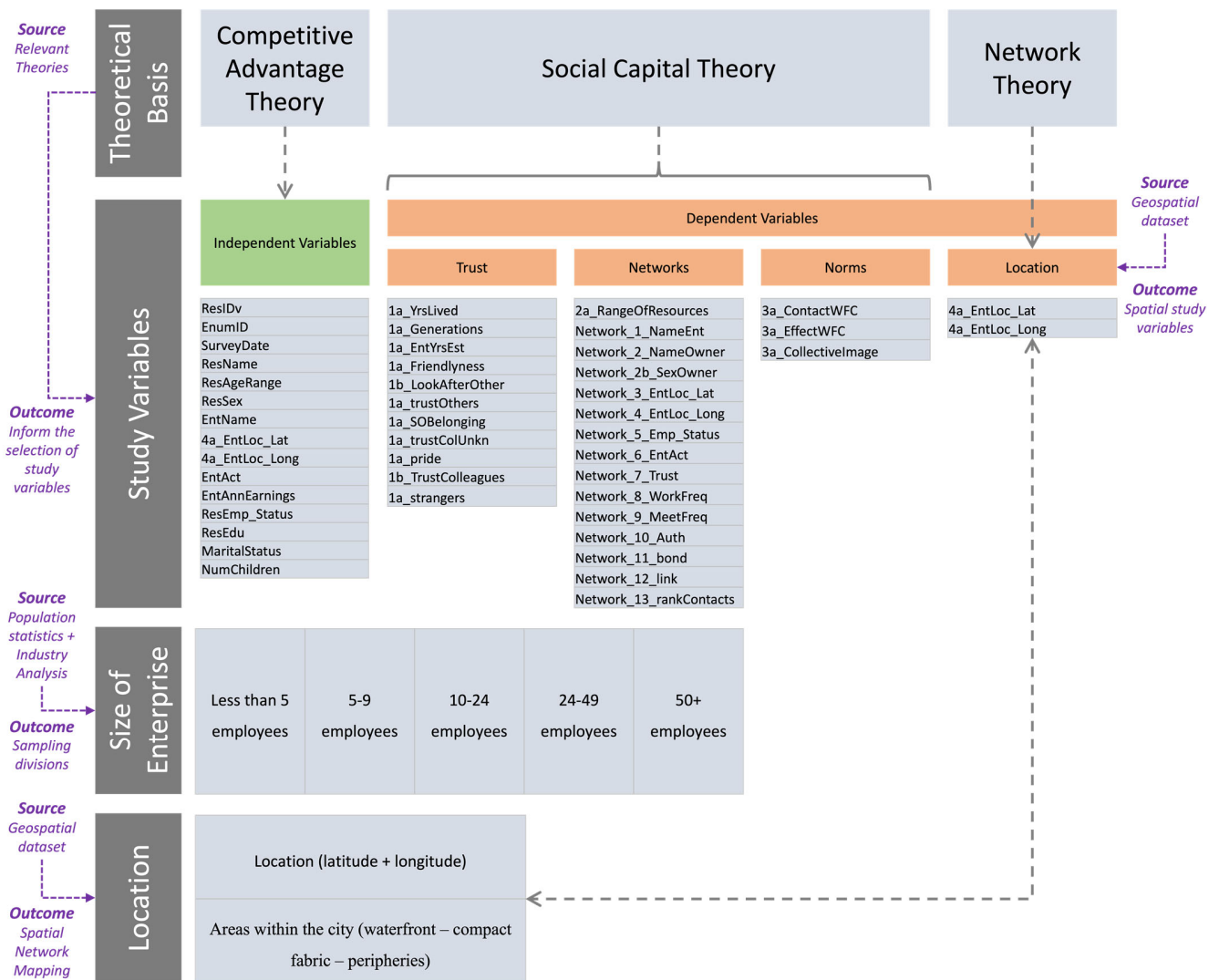
Figure 4-12 – Connections between theories and framework design with review of sources of information that feed in each section of framework
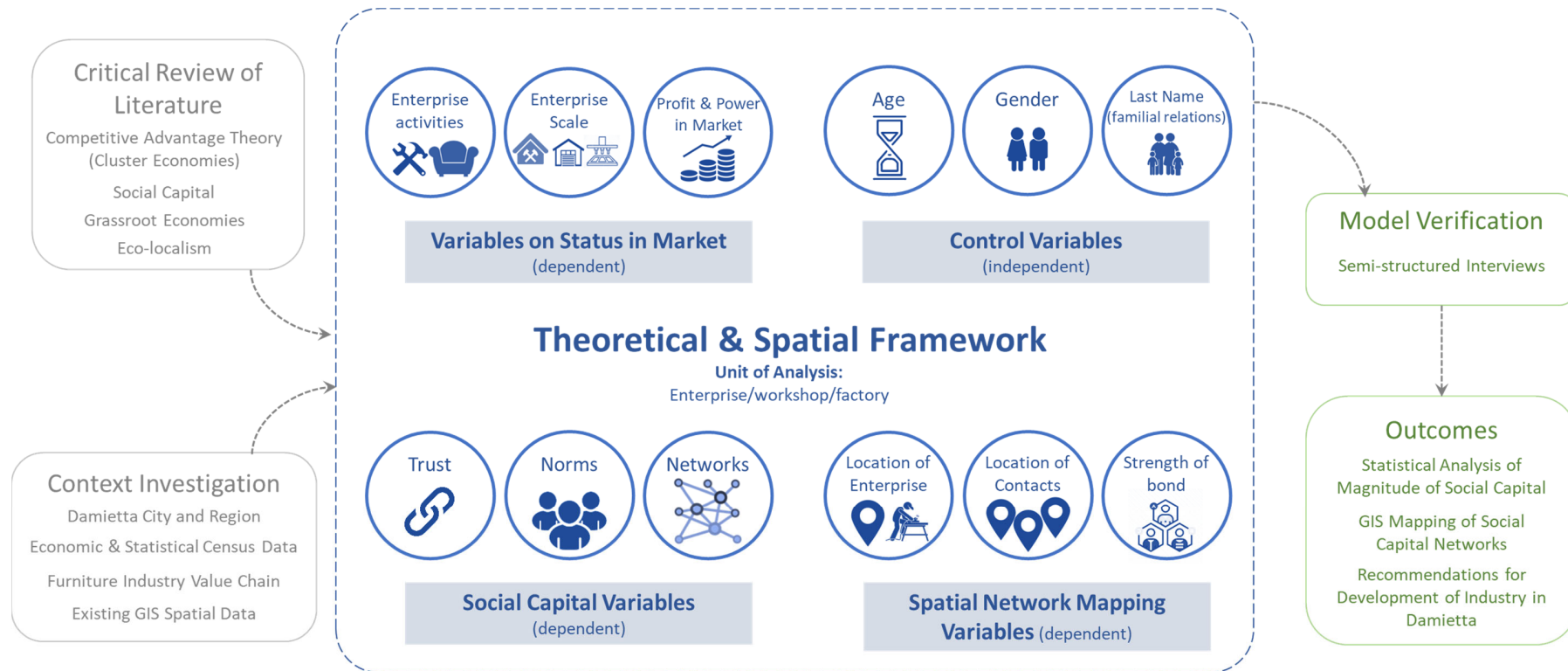
Figure 4-13 - Theoretical and Spatial Framework

4.9.2. Themes and Variables

Survey aims to measure the aspects of Damietta's furniture industry MSMEs. Variables measuring each aspect have been developed. The survey questions were designed to ensure all variables are addressed through the survey. This list includes the four identified themes and the sub-themes according to which the variables are identified.

- **Social Cohesion**
  - Trust
  - Reciprocity
- **Networks**
  - Network Resources
  - Contact Statuses
  - Bonds
  - Bridges
  - Links
- **Norms**
  - Belief in activities collegiality
  - Agreeing with collective rules
- **Locations**
  - Location of Enterprise
  - Location of Bonds
  - Location of Bridges
  - Location of Links

The following Table 4-9 includes an account of all variables (column 5), their types (column 2 and 3), and their affiliation to the four categories specified in the theoretical framework above (column 4). A complete survey mapping matrix is also included in the Survey Design Variables Matrix in the appendices section, which includes further information on what each variable is measuring, questions format, and how results are calculated. The two main categories prevalent in the variables and questions are **social capital and network mapping** as they are the focus of the inquiry in this research.

Table 4-9 - Variable Mapping for Framework and Survey

Types of Variables

Social Capital	Control Variables	Spatial Network Mapping Variables	Status in the Market

Variables Relevant to Themes

Social Cohesion	Networks	Norms	Locations

Var ID	Var Type	Theme	Topic of Study	Variable Label
V1	IV		0a Survey ID	Respondent ID in Survey
V2	IV		0a Survey ID	Enumerator ID
V3	IV		0a Survey ID	Date of data collection
V4	IV		0b Basic Respondent Data	Respondent Name
V5	IV		0b Basic Respondent Data	Respondent Age Range
V6	IV		0b Basic Respondent Data	Respondent gender
V7	IV		0c Enterprise Info	Enterprise Name
V8	DV		4a Location of Enterprise	Enterprise Location Latitude
V9	DV		4a Location of Enterprise	Enterprise Location Longitude
V10	DV		0c Enterprise Info	Enterprise Activity
V11	IV		0c Enterprise Info	Enterprise Annual Earnings
V12	IV		0d Respondent Status	Respondent Employment Status
V13	IV		0d Respondent Status	Respondent Education
V14	IV		0e Respondent Family Data	Respondent Marital Status
V15	IV		0e Respondent Family Data	Number of Children
V16	DV		1a Trust	Years lived in Damietta
V17	DV		1a Trust	Generations Lived In Damietta
V18	DV		1a Trust	Years established enterprise
V19	DV		1a Trust	Friendliness
V20	DV		1b Reciprocity	Looking after each other
V21	DV		1a Trust	Trusting each other
V22	DV		1a Trust	Sense of Belonging
V23	DV		1a Trust	Trust Unknown colleagues
V24	DV		1a Trust	Pride to be part of profession
V25	DV		1b Reciprocity	Trust in contacts colleagues need
V26	DV		1a Trust	Strangers in Damietta
V27	DV		3a Belief in Collegiality	Knowledge contact with CWWFI
V28	DV		3a Belief in Collegiality	Effect of CWWFI on Collegiality
V29	DV		1b Reciprocity	Asking for help from Others
V30	DV		1b Reciprocity	Giving help to Others
V31	DV		1b Reciprocity	Giving recommendations someone you know
V32	DV		1b Reciprocity	Giving recommendations someone you don't know
V33	DV		3a Belief in Collegiality	Working for collective interest
V34	DV		3a Belief in Collegiality	Trust evolution in time
V35	DV		2a Network Resources	Range Of Resources on Market
V36	DV		Multiple Topics	Network Name of enterprise
V37	DV		Multiple Topics	Network Name of owner
V38	DV		Multiple Topics	Owner gender
V39	DV		Multiple Topics	Enterprise Location Latitude
V40	DV		Multiple Topics	Enterprise Location Longitude
V41	DV		2b1 Occupation	Employment Status
V42	DV		Multiple Topics	Enterprise Activity
V43	DV		Multiple Topics	Tie with Contact trust
V44	DV		Multiple Topics	Tie with Contact Work frequency
V45	DV		Multiple Topics	Tie with Contact Meeting frequency
V46	DV		2b2 Authority	Tie with Contact Authority In Market
V47	DV		2c1 + 2c2	Tie with Contact Is Contact Bond Or Bridge
V48	DV		2c3 Links	Tie with Contact Is Contact link
V49	DV		Multiple Topics	Rank All contacts given

4.9.3. Synthesis & Validation For Survey Design

The developed framework and variables have been synthesised into survey questions to address the variables in a measurable way. The survey questions were developed into a mix of Likert scale and filling text questions. To validate the framework and survey design, part of the semi-structured interviews conducted with enterprise owners (n = 7) focused on questions related to the framework structure and degree of inclusion and reflection of real-life mapping of the industry. There was also focus on the survey questions, as interviewees were asked to fill in the survey and give feedback on the level of comfort for them to fill it out as well as any adjustments or hardships they faced. The researcher collated this feedback from the 7 interviewees to inform the development of the framework and survey.

One of the developments was related to the measurement of profitability for enterprises. Interviewees reported that they felt more comfortable answering non-monetary questions, as they found figures and margins of profit intimidating to fill in. The change was to include mention of general profit/loss scale (profitable – bare survival – loss/debt), which was changed in the survey design. Other aspects that were discussed included gender, referring to the lack of female participants in the industry, let alone owning or running an enterprise. There was also mention of the lack of collective vision towards larger benefits for the industry as interpreted by layman workshop owners and workers. Even with an expected negative or minimal answer to this inquiry, these aspects were still included in the framework and survey design as a control measurement of the lack of such notions rather than discarding the aspect of gender for example. The researcher attempted to document the male domination in the industry in Damietta through the lack of female participant in a representative data, similar to norms in the community.

4.10. Chapter Summary

In this chapter, the research design was identified as well as the researcher's philosophical stance and approach to research. Details of the research methodology and tools identified towards fieldwork design were also discussed, namely, semi-structured interview, survey and geospatial mapping. This chapter also introduced the design and synthesis of the theoretical framework and how the spatial aspects are applied within the variables. There was also a detailed account of the variables included in the study, the measurement of different aspects derived from literature and the context in Damietta. The theories that informed the design of the framework were examined in light of the fieldwork and practicality of the survey. Finally, the validation of the framework design was explained, which utilised semi-structured interviews.

Up to this point of the research, the research methodology, critical review of literature and case study context analysis and investigation have been finalised. This leads into the third and final part of this analysis, which is analysing the fieldwork data collected as illustrated in the previous chapters, and the synthesis of conclusions and recommendations that result from these findings. The following two chapters in Part 3 explore the findings and conclusions, respectively.

5

CHAPTER 5 – CASE STUDY – DAMIETTA'S FURNITURE INDUSTRY

5.1. Chapter Introduction

This chapter presents a collation and synthesis of secondary data on Damietta city and its furniture industry dynamics. The chapter also related the figures for Damietta to the national statistics for industry and GDP, highlighting the contribution and significance of Damietta's furniture industry on a bigger scale. This includes statistical information about the demographics, community and economic data for the industry. This information aims to contextualise the critical literature review in Chapter 2 and Chapter 3. This would inform the design and testing of the formulated theoretical and spatial framework as well, as it provides the background information to ensure the designed tool is appropriate for the case study. This chapter also presents the basis for the data collection and aids deeper investigation and analysis of the primary collected data (in Chapter 6) for more profound outputs and inclusive account on Damietta's furniture industry.

5.2. Damietta & its Industry in Figures

The Egyptian furniture industry is a well- and long-established domain that is linked to geographical advantage with notable access to major markets, reasonably low costs, and highly experienced labour with regard to woodworking skills. The wooden furniture industry in Egypt dates back centuries with mostly distinct styles that incorporate Islamic, British, and French elements into the

design, as well as part of the sector also producing rather international style designs. Exports in the furniture sector started in the 1960s and 1970s pursuing the Soviet Union and Eastern Europe. By the 1980s, the export market shifted in Egypt towards Arab countries to respond to the increasing demand for furniture resulting from booming urban growth in the region (ILO, 2016).

Damietta's strong history as an industrial hub did not just start with furniture making in the late 19th and 20th centuries. The city's pioneering pattern in industry is as early as being a 15th century leading city in ship-making on the Mediterranean (AlShayal, 2000). Damietta was also famous for textile industry production since the Greek and Roman eras in Egypt (AlShayal, 2000). With connections to European craftsmanship through the port and external trade, other industries prevailed in Damietta in the 18th and 19th centuries, such as furniture making, leather products and cheese making (AlShayal, 2000). As markets evolved from crafts to more prominent industrial production, furniture making took off on a regional scale, while other craft or food making activities stayed on a local scale.

According to the latest Egyptian Census data in 2013, the furniture industry accounts for 2.1% of total production in Egypt (ILO, 2016). Although this figure is relatively small compared to other industries' production in Egypt, a more significant figure for this research is that of the number of establishments the furniture industry, which is by far the highest among all industry sectors (as shown in Table 5-7). The furniture industry is also among the highest in terms of number of employees in the sector, i.e., roughly 11% of the employees in the Egyptian manufacturing sector. The highest concentration of the furniture industry is located in Damietta, Cairo and Sharkeya respectively (ILO, 2016).

According to 2019 census data and the ILO's STED (Skills for Trade and Economic Diversification) report, 64% of employed persons in manufacturing activities in Damietta work in the furniture industry, and 30% of all employed

persons in Damietta work in the industry. Damietta also accounted for 22% of furniture establishments and 25% of employees of the Egyptian furniture industry in 2013. The furniture industry in Damietta also accounted for approximately 50% of the net value added of the entire manufacturing sector in Damietta, and 30% of the net value added of the total furniture industry in Egypt (ILO, 2016). In a study about creative clusters in Southern Mediterranean countries, Damietta city is recognised as a furniture cluster with effective input as well as potential for the EU's UNIDO project to encourage entrepreneurship in the region (ILO, 2016,UNIDO, 2015). In a study about creative clusters in Southern Mediterranean countries, Damietta city was regarded as a furniture cluster with effective input as well as potential for the EU's UNIDO project to encourage entrepreneurship in the region (UNIDO, 2015) (Table 5-11).

5.3.   Damietta Demographics and Community

Although Damietta is considered a semi-rural region, its governorate's population is almost 1.5M, with around 300k residents living in Damietta city (CAPMAS, 2019a). The percentage of population at working age (between 15-65 years old) is around 66% (as shown in Table 5-1 and Figure 5-1 below). Even though the percentage of females in Damietta is similar to that of males (males being slightly more in numbers), data collection survey and interviews have shown that the presence of women in the furniture industry is almost negligible.

Table 5-1 - Population Distribution of Damietta Governorate (CAPMAS, 2019a)

Age Range	Males	Females	Total	Percentage of Population
0-4	100,277	96,479	196,756	13%
5-14	161,985	148,132	310,117	21%
15-44	348,995	341,717	690,712	46%
45-59	102,894	94,436	197,330	13%
60+	55,354	46,496	101,850	7%
Total	769,505	727,260	1,496,765	(1.57% of Egypt's population)
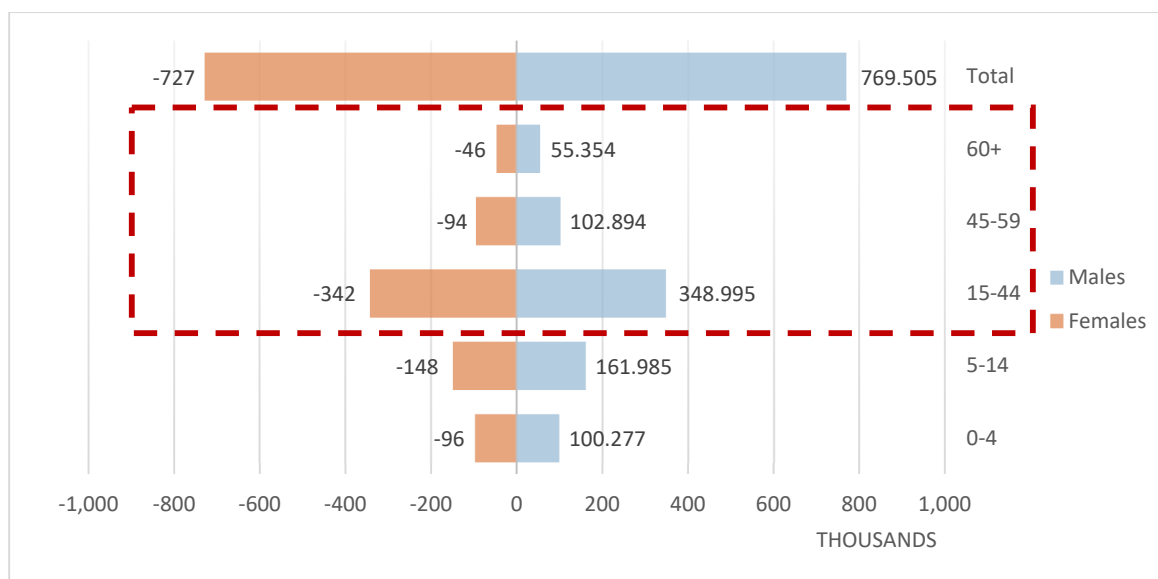
Figure 5-1 - Population Distribution with Age in Damietta (CAPMAS, 2019a)

Comparing this data with educational status would show that around half the population in Damietta hold an intermediate degree or below intermediate education (preparatory education, secondary education, industrial education or similar). This fact indicates that the influence and domination of Damietta in the industry did not necessarily require higher levels of education thus far, but rather a set of skills passed down through generations. About 20% of the population is also illiterate, which is also not a barrier to get involved in the furniture industry, but rather a barrier to the development of skillset and business that requires access to training and opportunities.

Table 5-2 - Population Distribution according to Educational Status in Damietta (CAPMAS, 2019a)

		Males	Females	Total
Total	%	100	100	100
	count	582,462	551,139	1,133,601
Illiterate	%	20.27	20.19	20.23
	count	118,057	111,277	229,334
Read & Write	%	13.82	11.16	12.53
	count	80,503	61,497	142,000
Illiteracy Erase	%	1.10	0.52	0.82
	count	6,425	2,864	9,289
Intellectual	%	0.55	0.51	0.53

		Damietta	Cairo	Egypt
	count	3,224	2,801	6,025
Below Intermediate	%	20.30	19.00	19.70
	count	118,096	104,658	222,754
Intermediate	%	30.10	32.70	31.40
	count	175 360	180 026	355 386
Above Intermediate	%	3.00	3.50	3.20
	count	17 540	19 162	36 702
University	%	10.50	12.10	11.30
	count	60 912	66 663	127 575
Above University	%	0.40	0.40	0.40
	count	2,345	2,191	4,536

Regarding the type of education, with specific focus on vocational education (Table 5-3), census data shows that the percentage of students in Damietta enrolled in industrial education is around 1.3% of the total population of Damietta and only 2.2% of the total number of students in industrial education in Egypt (CAPMAS, 2019a). The number of vocational industrial schools in Damietta is considered very low compared to that in Cairo and nationally as well. These figures can be considered particularly low considering that Damietta is an industrial city with unique industrial activity that aims to continue and grow with the following generations through specialised vocational education.

Table 5-3 - Technical/Vocational Education in Damietta 2017-2018 (CAPMAS, 2019a)

Type of Vocational Education		Count			% Damietta of Egypt	% Cairo of Egypt
		Damietta	Cairo	Egypt		
Industrial	Schools	29	111	1,157		
	Classes	595	2,085	25,106		
	Students	19,937	64,483	897,936	2.2%	7%
Commercial	Schools	21	104	866		
	Classes	272	1,597	17,904		
	Students	8,746	65,182	751,268	1.2%	9%
Agricultural	Schools	5	-	243		
	Classes	65	-	5,083		
	Students	2,061	-	215,638	1.0%	0%
Total Number of Students in Vocational Education		30,744	129,665	1,864,842	1.6%	7%

5.4. Business, Economy and Employment in the Industry

Examination of the census data showed the number of employed individuals in industry in Damietta, which includes only formal employees (Table 5-4). The

highest percentage of this distribution is 28% of employment being in manufacturing industries (mainly furniture industry) (Table 5-5). It is important to note that this figure is lacking a large percentage of informal workers and employees who work on daily or weekly wages in small workshops with no registration. Even with this fact considered, furniture industry employment is dominating the employment statistics for the governorate.

Table 5-4 - Estimate of Employed Persons in Damietta (15 years and above)
(CAPMAS, 2019a)

	Years					
	2018	2017	2016	2015	2014	2013
% Distribution (% of overall employment in Egypt)	1.6%	1.7%	1.7%	1.6%	1.6%	1.5%
Estimate of Employed Persons (15 years and above)	410,200	429,700	424,600	404,500	395,100	371,500

Table 5-5 - Estimates of Employed Persons in Damietta by Industry (15 years and above) (CAPMAS, 2019a)

Code	Sector	Male	Female	Total	%
A	Agriculture, hunting, forestry & cutting of wood trees	47,000	2,900	49,900	12%
B	Mining & quarrying	0	0	0	0%
C	Manufactures	113,800	1,600	115,400	28%
D	Electric, gas, steam, air condition supplies	6,500	200	6,700	2%
E	Water support, drain recycling	2,800	800	3,600	1%
F	Construction & building	34,300	0	34,300	8%
G	Whole and retail sale vehicles, motorcycles repairing	53,000	11,600	64,600	16%
H	Transportation & storage	32,300	500	32,800	8%
I	Food, residence services	5,400	0	5,400	1%
J	Information, Telecommunication	1,400	900	2,300	1%
K	Insurance & financial intermediation	2,000	800	2,800	1%
L	Real Estate, renting	200	0	200	0%
M	Specialised technical, scientific activities	7,100	200	7,300	2%
N	Administrative activities & support services	2,300	500	2,800	1%
O	Public administration, defence, social solidarity	10,100	8,100	18,200	4%
P	Education	11,500	28,600	40,100	10%
Q	Health & social work	4,900	9,900	14,800	4%
R	Amusement & creation & arts activities	1,200	0	1,200	0%
S	Other services activities	5,300	900	6,200	2%
T	Services of home service for private households	0	1,100	1,100	0%
U	International and regional agencies and organisations	0	0	0	0%
V	Activities not classified	600	0	600	0%
	Total	341,700	68,500	410,200	
	%	83%	17%		

5.4.1. Economy of Production in Damietta's Furniture Industry

According to census data (ILO, 2016, from Census Data 2013), the furniture industry is considered one of the most profitable industries within the manufacturing sector in Damietta. This is indicated by the high Net Value Added (NVA) (Patel and Cherukuri, 2002) production figures for furniture manufacturing in Damietta compared to other industries, where the figure for furniture is within the same category as the lucrative refined petroleum products (Table 5-6). As the NVA represents the price offered to consumers less the cost of production, with 51% NVA (ILO, 2016, from Census Data 2013), the furniture industry would prove quite profitable. This is yet one angle, which would need to be overlapped with the following data on employment, as well as material import and export among others to provide a clear overview of the economic profile of the industry in Damietta.

Table 5-6 - Net value added and production for selected manufacturing sectors, 2013 (*ILO, 2016, from Census Data 2013*)

ISIC Division Code	ISIC Rev 4 Description	Net Value		Total Production		NVA/Production
		Value (EGP billion)	% of total manufacturing	Value (EGP billion)	% of total manufacturing	% of NVA out of total production
10+11	Manufacture of food products and beverages	33.2	12	117.4	18	28
12	Textile	5.6	2	18.2	3	31
14	RMG (Manufacturing of wearing apparel)	10.6	4	21.4	3	50
19	Manufacture of coke and refined petroleum products	102	37	140.3	21	73
20	Manufacture of chemicals and chemical products	30.2	11	54.9	8	55
21	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	6	2	16	2	38
23	Manufacture of other non-metallic mineral products	19	7	46.9	7	41
24	Manufacture of basic metals	23.1	8	111.8	17	21
27	Manufacture of electrical equipment	5.6	2	16	2	35
31	Manufacture of furniture	6.9	2.5	13.6	2	51
	Others	36.8	13	…	16	34
	Total Manufacturing	**279**	**100**	**666.3**	**100**	**42**

5.4.2. Establishments and Employment

There are different figures when it comes to the number of establishments of furniture industry in Damietta. This is partially related to the percentage of informal economy in Egypt, as well as the generalised datasets in the census with limited access to detailed data. According to 2017 census data, Damietta has 429,700 employed persons (CAPMAS, 2019c), with 30% of all employed persons in Damietta work in the industry as well as Damietta accounting for 22% of furniture establishments in Egypt (ILO, 2016). Table 5-7and

Table 5-8 exhibit a collation of this data from different statistical references in CAPMAS, which indicate the agglomeration of a large number of furniture enterprises in the city and region of Damietta (economic cluster).

Table 5-7 - Number of Enterprises and Employed Persons in Damietta based on census data (*CAPMAS, 2019*; *ILO, 2016 from Census Data 2013*)

Unit Scale	Total Number of employed persons	Number of employed persons in Furniture industry	Number of Furniture Enterprises
Egypt	26,001,600 **	270,222 *	104,250 *
Damietta	429,700 **	128,910 *** (30% of total in Damietta)	22,935 *** (22% of total Furniture Enterprises)

*   Data from census 2013.
**   Data from census 2017.
***   Estimated number from ratio/ percentage from statistical data.

Table 5-8 - Distribution of Enterprises in furniture industry as MSMEs categories in Egypt (*CAPMAS, 2019*; *ILO, 2016 from Census Data 2013*)

Year	Unit scale	Total number of employed persons in furniture industry	Total number of furniture enterprises	Number of enterprises according to employee				
				Less than 5 employees	5-9 employees	10-24 employees	25-49 employees	50+ employees
2013	Egypt	270,222 *	104,250 *	98,728 *	5,006 *	369 *	56 *	91 *
			100%	94,7%	4.8%	0.35%	0.053%	0.087%
2013	Damietta	128.910 ***	22,935 ***					

*   Data from census 2013.
**   Data from census 2017.
***   Estimated number from ratio/percentage from statistical data.

5.4.1. MSMEs in Furniture Industry in Egypt

The dominance of micro and small-sized enterprises in the furniture industry landscape in Egypt is undoubted even with discrepant figures from different data sources (ILO, 2016). The following Table 5-9 shows not only the dominance of micro and small enterprises, but the notable rise of their numbers between the years 2006 and 2013. Hence, micro, small and medium sized enterprises (MSMEs) in the furniture industry represent 99% of the total number of enterprises, with about 95% being micro businesses (less than 5 employees). Although this data dates back to 2013, it can hardly be used to provide rough estimates of the numbers today, the ratios they reflect feature undeniable patterns that seem to persist according to observations, interviews and survey results. Through examining Table 5-10, there is a clear majority of male dominance and private sector dominance over the furniture industry in Egypt.

Table 5-9 - Distribution of Enterprises in furniture industry as MSMEs categories
(*International Labour Organization (ILO), 2016, from Census Data 2013*)

Year	Total number of employed persons	Total number of enterprises	Number of enterprises according to employee				
			Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
2006	255,065	89,209	8,729	7,069	285	70	56
2013	270,222	104,250	98,728	5,006	369	56	91

Table 5-10 - Employed persons in furniture enterprises by gender and occupation categories (ILO, 2016)

Occupational Categories	Public Sector	Private Sector	Male	Female
Employers	-	112,142	111,487	655
Managers	11	890	840	61
Specialists and technicians	1	1,787	1,754	34
Administrative Workers	5	1,645	1,328	322
Supervisors	2	832	810	24
Technical works and operators	66	113,326	113,173	219
Others	24	39,491	39,069	446
Total	109	270,113	268,461	1,761

Employed persons in furniture enterprises by gender and occupation categories - Male

Others 15%
Employers 42%
Specialists and technicians 1%
Managers 0%
Administrative Workers 0%
Supervisors 0%
Technical works and operators 42%

Legend:
- Employers
- Managers
- Specialists and technicians
- Administrative Workers
- Supervisors
- Technical works and operators
- Others

Employed persons in furniture enterprises by gender and occupation categories - Female

Others 25%
Employers 37%
Managers 4%
Specialists and technicians 2%
Administrative Workers 18%
Supervisors 1%
Technical works and operators 13%

Legend:
- Employers
- Managers
- Specialists and technicians
- Administrative Workers
- Supervisors
- Technical works and operators
- Others

Figure 5-2 - Employed persons in furniture enterprises by gender and occupation categories (ILO, 2016)

5.4.2. Furniture Industry Economic Growth

The furniture industry in Egypt has been a growing market over the past two decades (Figure 5-3), where production and consumption have been reported to increase significantly over the period between 1999 and 2010 with expectation to grow over the following decade (ILO, 2016). This also applies to exports and imports of furniture in Egypt; although the exported and important types of furniture differ according to the global market needs and supply/demand in different countries. According to the UNIDO (2015), the furniture industry cluster in Damietta offers more than 100k jobs, a turnover of 934M $ and 351 M $ annually, with more than 36k workshops and factories in Damietta to take through this magnitude of production (Table 5-11).
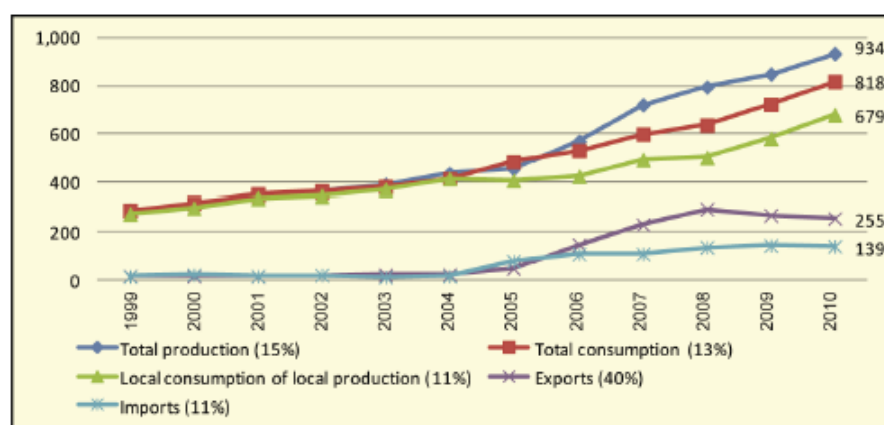
Figure 5-3 - Egyptian Furniture Industry Growth (US$ million) (ILO, 2016)

Table 5-11 - Magnitude of Furniture Industry cluster in Damietta (UNIDO, 2015)

	Number of Companies	Number of Jobs	Turnover	Exports	Creative Competitive advantage
Furniture in Damietta	36,000 (9,000 companies)	~100,000	934 M $ (in 2010)	351 M $ (in 2013)	Develop their own designs (style)

As an important measure of inflation, the Commodities and Services Consumer Price Index (CPI) for the furniture industry in Egypt is reported to be much lower than the general CPI in Egypt (Table 5-12) (CAPMAS, 2019a). This indicates that even with the instabilities in the global market, the furniture industry is less affected than other industries and commodities, which places investment and development of business in the furniture industry at a safer place than other types of industries in Egypt (Figure 5-4). That said, it cannot go unmentioned that inflation in Egypt has manifested at a much higher rate in the past two decades (around 2006 onwards) (Figure 5-5), which has highly affected all industries in terms of prices of raw materials, production cost, transport costs and so on.

Table 5-12 - Commodities and Service Consumer Price Index (CPI): General vs ''Furniture, Domestic Equipment and Maintenance' in Egypt (CAPMAS, 2019a)

Month 2010	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Furniture CPI	223.8	223.5	223.5	224.7	225.6	232.6	234.3	233.5	234.1	234.7	234.7	234.8
General CPI	257.9	258.6	261.2	265.2	265.6	274.8	281.5	286.5	293.8	301.4	299.1	288.9
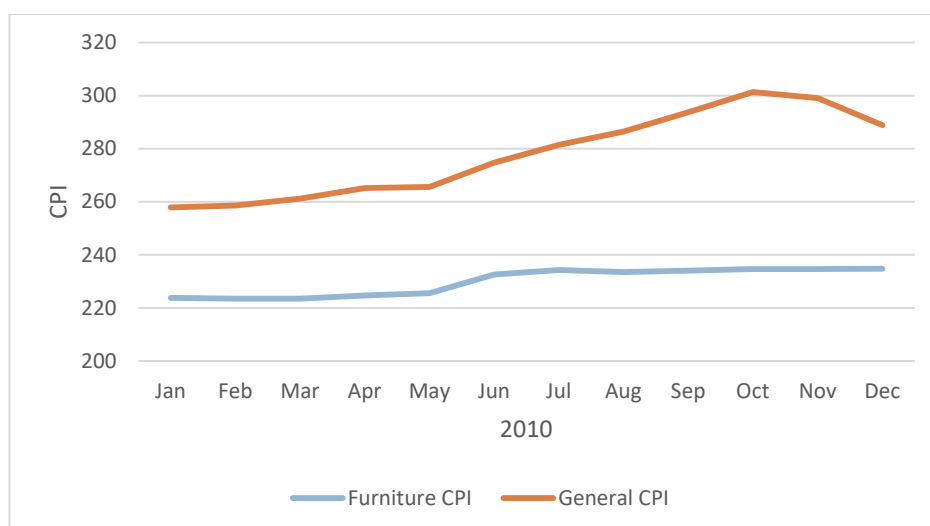
Figure 5-4 - Commodities and Service Consumer Price Index (CPI) General vs 'Furniture, Domestic Equipment and Maintenance' in Egypt in 2018 (CAPMAS, 2019a)
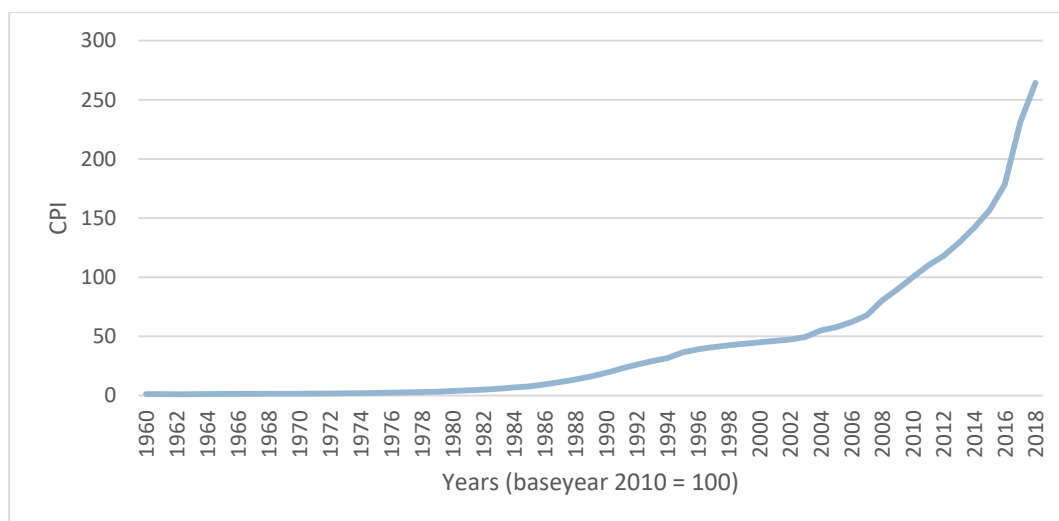
Figure 5-5 - General Consumer Price Index (CPI) in Egypt 1960-2018 (World Bank, 2020)

Regarding purchases and sales figures in the industry, Damietta's private sector (wholesale and distributors) amounted to a total of 19 M EGP (around 1 M $) in 2015 (CAPMAS, 2019a).It is a significant comparison that wholesale traders contribute to a much lower portion of the purchases and sales in Damietta than small scale distributors (Table 5-13 and Figure 5-6). This emphasises the role and magnitude of MSMEs and local businesses in contributing to the industrial identity and production in the city and governorate. The review of two consecutive years in Figure 5-6 also shows the increase in purchases and sales in Damietta for both wholesale and distributor enterprises.

Table 5-13 - Wholesale and Distributors in Private Sector in Damietta (2014&2015) (CAPMAS, 2019a)

(EGP)	2014			2015		
	Number of Establishments	Purchases	Sales	Number of Establishments	Purchases	Sales
Wholesale	860	1,750,700	2,323,200	946	1,342,279	1,761,655
Distributors	27,058	22,392,962	26,728,118	36,817	13,123,773	17,724,061
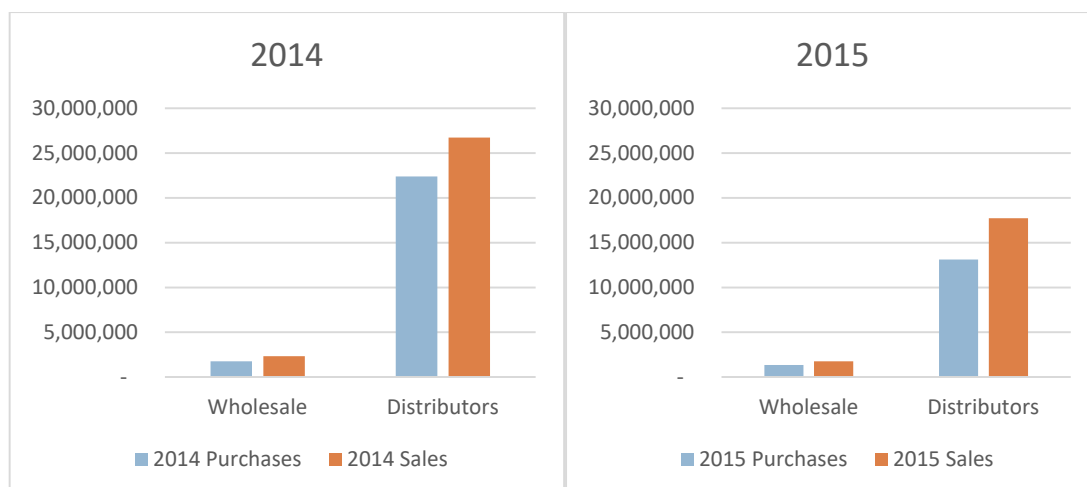
Figure 5-6 - Wholesale and Distributors purchases and sales in Private Sector
in Damietta (2014&2015) (CAPMAS, 2019a)

5.4.3. Imports and Exports in Furniture Industry

With different types of products and styles within the furniture industry, and the difference in demand within each country, Egyptian furniture industry is exposed to both exporting certain types of furniture and, at the same time importing other products. According to ILO report (2016), Egypt exports furniture to Arab countries more than any other, with Saudi Arabia on top of this list, in addition to United Arab Emirates, Iraq and Qatar (Figure 5-7). A solid 85% of Egypt's exported furniture goes to Arabic countries, followed by 6% exported to Europe (Figure 5-9). In terms of imported furniture to Egypt, China is the principal provider of these products (42%), followed by Germany, Italy and Turkey with close percentages (8-9%). Egypt's imports from other European counties are negligible in comparison.

It is worth mentioning that Egypt used to export furniture to Latin and Caribbean countries in the early 2000s. However, such exports have declined during the past decade.
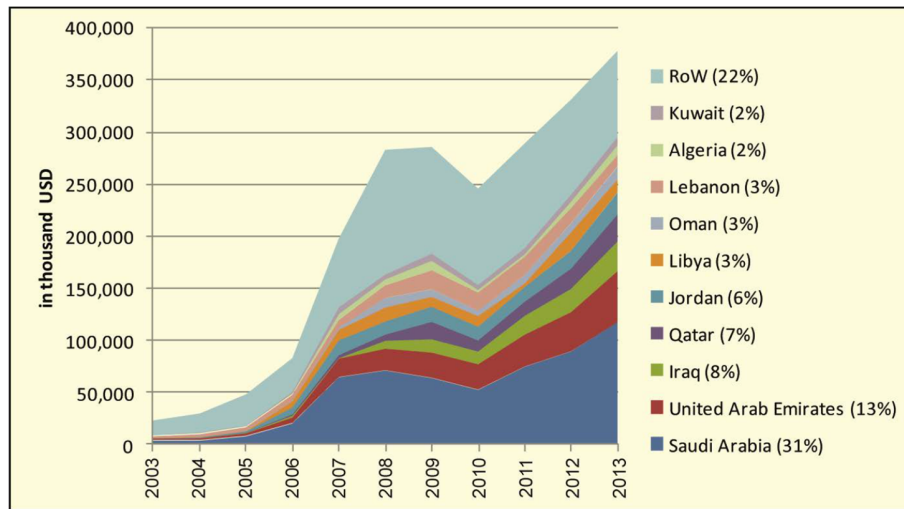
Figure 5-7 - Top ten importers of Egyptian Furniture 2003-3013 (ILO, 2016)
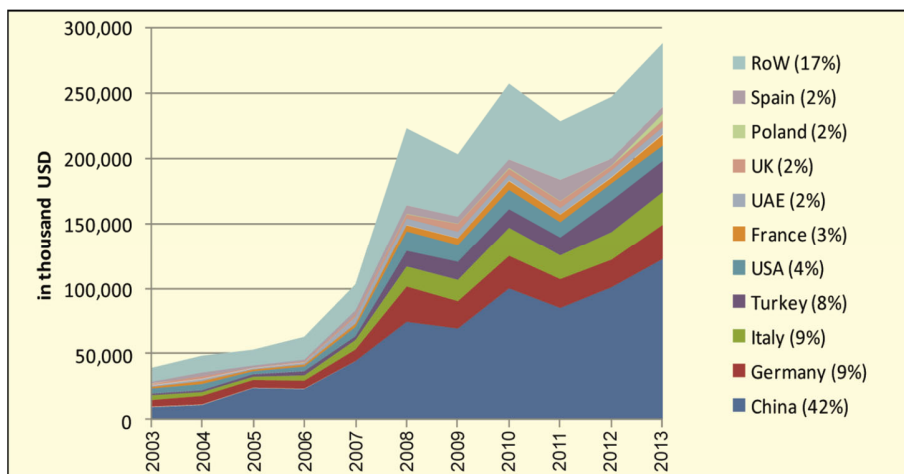
Figure 5-8 - Top ten exporters of Egyptian Furniture 2003-3013 (ILO, 2016)
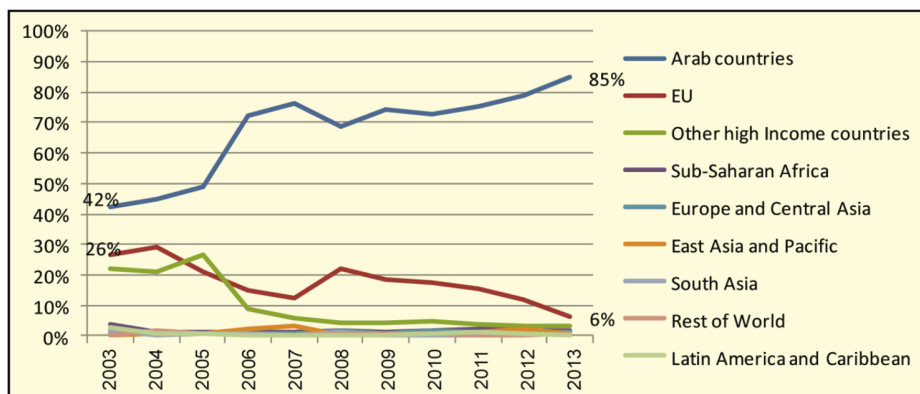
Figure 5-9 - Egypt furniture exports by destination region (%), 2003 – 2013 (ILO, 2016)

Regarding the types of furniture exported by Egypt, this includes Neoclassic European style furniture (bedrooms, living spaces, salons, etc.) as a main component, in addition to fixtures and chandeliers (ILO, 2016). Other exports include lamps, lighting fixtures and chandeliers to Arab countries as well.

Table 5-14 - Top ten products exported by Egypt and their top two target markets, 2013 (ILO, 2016)

Rank	Product Code	Product Description	Exported value in 2013 (US$ thousand)	Total export share in 2013 (%)	Most significant export destinations
1	940360	Other wooden furniture	303,404	80	Saudi Arabica (34%), UAE (14%)
2	940591	Lamps and glass light fittings	19,116	5	China (13%), Saudi Arabia (12%)
3	940510	Chandeliers and other electric ceiling or wall lighting fittings	16,318	4	SA (22%), UAE (17%)
4	940320	Furniture - metal	12,215	3	SA (35%), Qatar (12%)
5	940600	Prefabricated buildings	9,528	3	Algeria (69%), India (10%)
6	940540	Electric lamps and lighting fittings	5,183	1	Sudan (62%), SA (9%)
7	940390	Furniture parts	2,929	1	SA (22%), Qatar (11%)
8	940330	Office furniture - wooden	2,411	1	Qatar (26%), SA (25%)
9	940310	Office furniture - metal	1,457	0	UAE (30%), SA (26%)
10	940350	Bedroom furniture - wooden	853	0.2	SA (64%), Qatar (10%)
		Other products	4,139	1	
Total Exports			377,553	100	SA (31%), UAE (13%)

Imported furniture market in Egypt is different from what was reviewed above for exports. The focus with imports is modern style furniture from China and Turkey (Table 5-15) (ILO, 2016). There is also a considerable percentage of imports of electric lamps and light fittings, as well as prefabricated interior design structures. Metal-related furniture is also another major import within the sector. The major importer for all of the imported products is China, while imports of light fixtures are also purchased from Italy, and Metal furniture is imported from Turkey.

Table 5-15 - Top ten products imported by Egypt and their top two target markets, 2013 (ILO, 2016)

Rank	Product Code	Product Description	Exported value in 2013 (US$ thousand)	Total export share in 2013 (%)	Most significant export destinations
1	940360	Other wooden furniture	53,417	19	China (36%), Turkey (13%)
2	940540	Electric lamps and lighting fittings	46,375	16	China (56%), Germany (11%)
3	940600	Prefabricated buildings	28,275	10	Italy (26%), China(16%)
4	940320	Furniture - metal	19,950	7	China (35%), Turkey (11%)
5	940510	Chandeliers and other electric ceiling or wall lighting fittings	16,357	6	China (68%), Italy (7%)
6	940190	Parts of seats other than those of No 94.02	15,356	5	China (32%), India (25%)
7	940330	Office furniture - wooden	13,615	5	China (39%), Turkey (23%)
8	940290	Medical, surgical, dental or veterinary furniture and parts	13,142	5	Germany (22%), China (21%)
9	940120	Seats, motor vehicles	11,570	4	China (31%), Germany (29%)
10	940599	Lamps and lighting fittings	9,044	3.1	China (75%), Italy (11%)
		Other products	60,629	21	
Total Exports			288,330	100	China (42%), Germany (9%)

5.4.4. Society and Vocational Skills Support

Support to the society in Damietta is reported to include three main aspects; vocational skills rehabilitation, cultural services, and social services to the community (Table 5-16). CAPMAS reports (CAPMAS, 2019a) show that the number of beneficiaries for vocational rehabilitation are the lowest among the three aspects of support over four consecutive years (Figure 5-10 - Number of Beneficiaries from services by National Subsidised Societies in Damietta).The highest in terms of number of beneficiaries is the social services, which is not

related to, or reflecting on, any development in the furniture industry. Similarly in terms of the value of support, social services receive by far much higher amounts of subsidies from the government, while vocational skills and cultural services are negligible in comparison (Figure 5-11).

Table 5-16 - Beneficiaries from Services by National Subsidised Societies in Damietta 2013-2016 (CAPMAS, 2019a)

	2013		2014		2015		2016	
	Number of Beneficiaries	Value (EGP)	Number of Beneficiaries	Value (EGP)	Number of Beneficiaries	Value (EGP)	Number of Beneficiaries	Value (EGP)
Vocational Rehabilitation	1,071	76,000	11,638	77,000	3,285	199,000	3,717	906,000
Cultural Services	19,270	150,000	26,108	120,000	9,797	202,000	10,422	284,000
Social Services	26,091	1,618,000	9,192	995,000	17,063	2,690,000	22,314	4,067,000
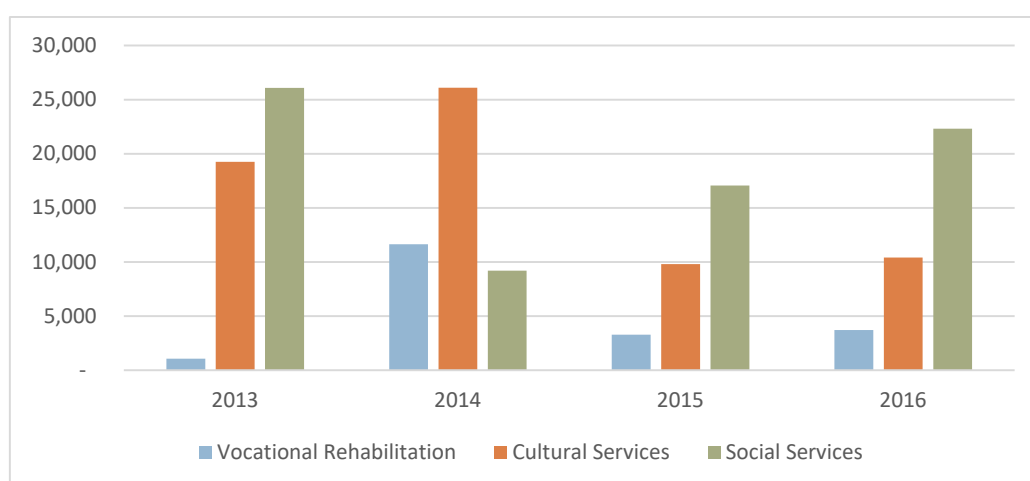
Figure 5-10 - Number of Beneficiaries from services by National Subsidised Societies in Damietta (CAPMAS, 2019a)
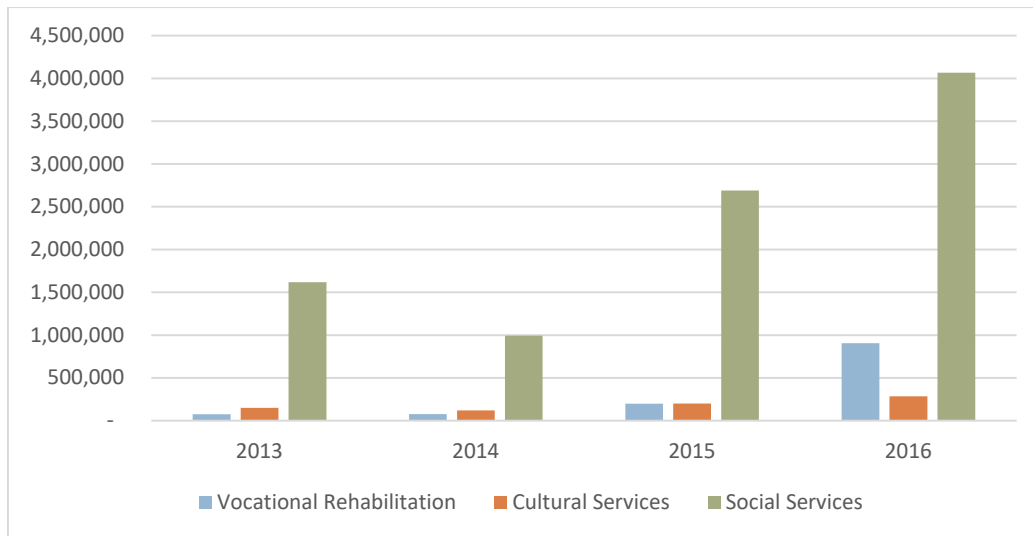
Figure 5-11 - Value of services provided by National Subsidised Societies in Damietta (CAPMAS, 2019a)

When examining the divisions of the vocational training subsidies on different sectors of industry and crafts in Damietta (Table 5-17) (CAPMAS, 2019a), the focus shifts away from the furniture industry training, and towards carpets, kilims, sewing and palm tree products (see, Figure 5-12 A&B). These crafts are considered to be related to social services support as well because they are mostly offered to marginalised or in need women in the society, whereas furniture and carpentry are considered a "man's craft", which is expected to be taught in business enterprises rather than through support by the government. This might be a suitable division of resources in other cities with different economic base and focus, but this would be deemed inadequate in an industrial city like Damietta where carpentry dominates the commercial enterprises and even residents' homes.

Number of Beneficiaries of Vocational Training provided by National Subsidised Societies in Damietta 2016

Legend:
- Carpet & Kilims
- Sewing
- Bamboo, palmtree products & toiletries
- Vocational Training Centre (Denting - Turning - Carpentry)
- Other

44%, 33%, 6%, 6%, 17%

Value of Services of Vocational Training provided by National Subsidised Societies in Damietta 2016

Legend:
- Carpet & Kilims
- Sewing
- Bamboo, palmtree products & toiletries
- Vocational Training Centre (Denting - Turning - Carpentry)
- Other

7%, 10%, 3%, 80%

Figure 5-12 (A&B) - Beneficiaries of Vocational Training provided by National Subsidised Societies in Damietta 2016

Table 5-17 - Beneficiaries of Vocational Training provided by National
Subsidised Societies in Damietta 2016 (CAPMAS, 2019a)

	Number of Beneficiaries	Value (EGP)
Carpet & Kilims	1647	65000
Sewing	1220	722000
Bamboo, palm tree products & toiletries	0	0
Vocational Training Centre (Denting - Turning - Carpentry)	210	32000
Other	640	87000
Total	3717	906000

5.5.   Furniture Industry Supply Chain

There are several stages in the wooden furniture production that involve woodcutting, carpentry, veneering, carving, staining and polishing, upholstery and assembly. There are also supporting industries such as glass and marble production, metal fittings and other accessories. Each of the activities along the supply chain takes place in different shops, while larger furniture firms and showrooms perform the key role of coordinating the production hierarchy, including choosing the designs and setting specifications as well as marketing the final products. Usually the larger firms perform most of these latter activities in-house (ILO, 2016). The following Figure 5-13 shows the supply chain as indicated in the STED report (ILO, 2016). This structure was the base to be completed through a primary data collection phase exploring the context through interviews (discussed further in methodology in Chapter 4) shows the supply chain as indicated in the report.

Design
- Design

Inbound
- Purchasing
- Inbound logistics

Manufacturing
- Manufacturing
  - Cutting and Carpentry
  - Carving
  - Veneering
  - Finishing (staining, polishing etc.)
  - Upholstery
- Assembly
- Testing

Outbound
- Value added services
- Packaging

Marketing, Sales and Distribution
- Marketing
- Distribution and sales (wholesalers, retailers, contract buyers and showrooms)

Services and Support
- Transportation
- After sales support

Figure 5-13 – Supply chain of Furniture Industry in Damietta (ILO, 2016)

5.5.1. Craft-based Commodities

There are parts of the supply chain in Figure 5-13 that relate to crafts, which are considered as an art form that the workers and workshops owners provide. These include a certain type of carpentry (carving called oyma), as well as staining and veneering. The most dominant of these is the oyma, as it is the part of the industry where the unique neo-classic designs are formulated by the carver (oymagy), and a 3D sample is created as the basis of the design of the final product. Such carvers are valued within the furniture industry community in Damietta, even with the incorporation of computer aided designs and CNC machines coming into play. Staining is also another craft that is declared important in the production line, as it is the final stage (the finishing touch) before the product is sent out to the clients. Further investigation through the data collection in this research reveals interesting spatial dynamics within these workshop types within the urban fabric of Damietta.

5.5.2. Raw Material (Wood) Import

With pressing economic conditions in the local and global industrial market and inflation that exponentially increased in Egypt over the past two decades, it is important to review the statistical evidence data on the material import to examine the stability, or lack there of, within the industry. For furniture industry, the different types of wood form the building blocks upon which the craft relies. These materials are mainly imported and transported to the city or surrounding towns from the port. The following Table 5-18 shows the changes in prices in 2017 and 2018 according to CAPMAS data (2019). It can be seen that the prices of all materials enlisted have increased over this year. It can also be observed that the highest change in % 2017-2018 was in the Zan Conter wood, which is highly used in Damietta's furniture. With 64% change in price, this can case instability in the sector and specifically to traders and workshop owners who might have already done business based on old figures that swiftly change with the market with no prior notice.

Table 5-18 - Wholesale Prices of Wood in Egypt: Annual, Quarterly and Annual Change Rate (2017 & 2018) (CAPMAS, 2019a)

Commodities and Description	Unit	% Change Rate 2017-2018	Annual Average Prices		2018			
			2017	2018	Jan	Apr	Jul	Oct
White Wood								
Swedish wood no.1	m3	13.56	4,720.00	5,360.00	5,168.00	5,232.00	5,520.00	5,520.00
Blank wood no.1	m3	14.57	3,544.19	4,060.75	3,840.00	4,051.00	4,176.00	4,176.00
Vaporised Zan wood								
Length from 1-17m m3	m3	10.38	7,341.84	8,103.75	7,904.00	7,999.00	8,256.00	8,256.00
Length from 1.8-3.5m m3	m3	30.84	7,852.45	10,274.00	9,792.00	9,800.00	10,752.00	10,752.00
Ablakaj size 153x153 cm B.B.C. degree								
Thickness 3mm	sheet	43.30	79.19	113.48	86.26	120.65	123.50	123.50
Thickness 4mm	sheet	53.18	84.50	129.44	109.25	123.50	142.50	142.50
Zan Conter Ablakaj size 122x220 cm								
Thickness 3mm	sheet	51.97	98.30	149.39	122.55	142.50	166.25	166.25
Thickness 4mm	sheet	64.05	118.75	194.81	157.00	185.25	218.50	218.50

Note: Price in EGP

Figure 5-14 - Annual Wholesale Prices of Wood in Egypt 2017 & 2018 (CAPMAS, 2019a)

5.5.3. Transportation Commodity

In terms of accessibility, Damietta city is most accessible by vehicles through international and intercity roads. There is no passenger train station nor airport to provide access for clients through means other than a car/bus or other vehicular public transport. The following Table 5-19 shows that the most abundant vehicle type in Damietta is the motorcycle, which has a direct relation to furniture industry, as many businesses would own a motorcycle, and use it with a back carriage to transport goods and products between workshops or to clients. This is only followed by private cars with around 77k cars registered in Damietta. Following this figure are the trucks and lorries which, similarly to motorcycles, are used to transport goods and products between workshops.

Table 5-19 - Transportation Vehicles by Type in Damietta (up to end of Dec 2017) (CAPMAS, 2019a)

Category	Type of Vehicles	Number of vehicles
Other Vehicles	Tuktuk	2,938
	Heavy Equipment	10
	Tractor	58
	Motorcycle	89,267
Vehicles & Vans	Truck	3,525
	Lorries	26,778
Public Service cars	Bury cars	49
	Governorate license	1,272
	Public Sector	1,138
	Government cars	468
Buses	Schools	93
	Travels	455
	Tourism	11
	Private buses	258
	Public buses	65
Cars	Diplomatic car	-
	Customs	-
	Commercial & Temporary	6
	Accessory	-
	Taxi	7,833
	Private car	77,208
Total		211,432
% of Vehicles in Egypt		2.10%

5.5.4. Norms and Organisations for the community

There are two main organisations in Damietta that are expected to influence the furniture industry community: 1) Chamber of Woodworking and Furniture Industry (CWWFI), and 2) Damietta Furniture city (DFC). The first is the commerce chamber in Damietta affiliated with the central branch in Cairo. Its role is to provide support, guidance, connection and opportunities to market products for small workshops and all businesses in the field in Damietta. This extent of CWWFI's intervention in the industry is to be determined through the data collection (interviews and survey).

The second enterprise (DFC) is a controversial megaproject situated on the east of Damietta Old city, which threatens the existence of many workshops in the city as it provides an alternative to the old city's structure in prefabricated factories and hangers. Semi-structured interviews were designed to explore DFC in more detail, and whether DFC and old Damietta can have mutually beneficial development direction going forward to inform decision-making.

5.6. Chapter Synthesis and Summary

This chapter investigated the secondary statistical and literary data on Damietta's furniture industry MSMEs in terms of economy, community, supply chain and the industry's relation and contribution to the national GDP (section 5.4). From the presented data, it can be concluded that Damietta presents a significant industrial hub that contributes to the national industrial profile in Egypt. The products designed and exported from Damietta's MSMEs offer a unique value and texture that is still needed in the market globally (with concentrations in the Arab countries as explained in section 5.4.3). On local and national scales, clients and stakeholders approach Damietta for furniture deals, as its MSMEs provide higher quality with lower cost, which gives Damietta's industry cluster an edge over other enterprises and businesses in Egypt.

Damietta's furniture industry also faces several challenges, which have been highlighted in this chapter. The landscape of global economic pressures reflects negatively on the industry in Damietta. Imports and exports are affects with policies and regulations in different countries, which has significantly shifted the exports market for Egypt's furniture products in the past decades (section 5.4.3). These pressures also manifest as constantly increasing cost of imported raw materials and incremental costs for production, hence contributing to the market becoming more volatile and uncertain (section 5.4).

Other aspects that were investigated is demographics, where the industry in Damietta shows as male-dominated, and the education system shows as lacking in terms of statistics and quality (section 5.3). A high percentage of residents are not educated, in addition to the lack of focus on vocational education, training and support provision from the local authorities and national educational system (section 0). This is a significant issue that is further investigated in the findings and conclusions below (Chapter 6 and Chapter 7). It is worth mentioning that demographics in Damietta show a non-aging community, which provides higher percentage of working-age human capital for the industry than in other cities in Egypt. Additionally, the lack of education for a portion of the community is not reflected on the residents' capacity to be actively involved in the furniture industry (section 5.4.2). The way the skillset is passed in an apprenticeship approach in Damietta has managed to partially surpass the missing link to vocational education.

Regarding the supply chain, the literature presented in this chapter examined the documented furniture industry production line, where all activities in a typical standardised process are examined (section 5.5). This forms the basis of analysis of on-ground supply chain in Damietta through overlapping this data with primary interview and survey data presented in Chapter 6 below.

This account on Damietta's furniture industry has been utilised along with the critical review of literature in Chapter 2 and Chapter 3 to inform the design and testing of the formulated theoretical and spatial framework (section 4.9). The information here also presented a base line for comparison between documented info about the industry and the city and the perception of users and MSME owners collated through the primary data in Chapter 6.

6

PART 4: ANALYSIS AND CONCLUSIONS

CHAPTER 6 – FINDINGS AND ANALYSIS

6.1. Introduction

In this chapter, the data collected so far is formally presented and analysed, giving way to indicative results to formulate, both qualitative and quantitative (Figure 6-1). The interviews analysis is presented after the transcription, and the themes that arose from them are used to refine the survey design and validate the framework. Another type of data that was collected is GIS data of Damietta, which is also presented and analysed as an overlap between the layers to interpret the bigger picture about the urban and socio-economic context in the study area. This is done through analysing the social capital network analysis both spatially and abstractly. Further exploration through urban observations and secondary GIS data analysis have also been incorporated in this research to inform the mapping and contribute to the final conclusions of this research.
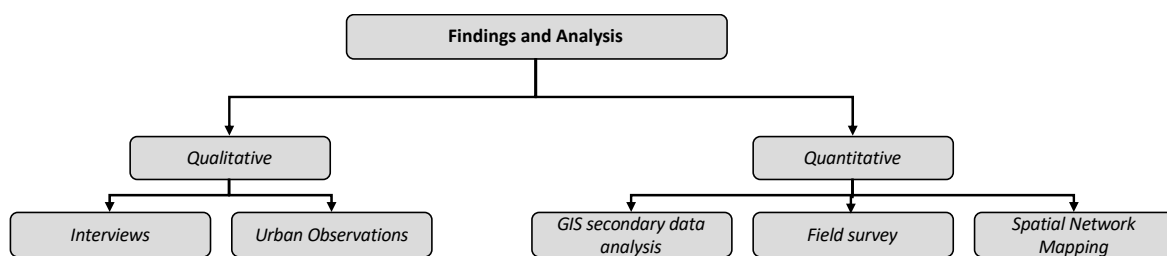
Figure 6-1 - Structure and contents of findings and analysis

6.2. Interviews Analysis

Seven interviews conducted as a first phase of the research were utilised to verify the themes and direction for the framework, survey and geospatial mapping process. The seven interviews were transcribed and analysed as described below.

6.2.1. Translation and Transcription

The interviews have been transcribed and translated from Arabic to English by the researcher. Data reduction techniques have been applied throughout the transcription to identify the substantive content while discarding the filler "padding" and repetitions (Gillham, 2005). The researcher aimed to retain the quality and character of the interview through keeping the meaning as expressed by the interviewee (Gillham, 2005).

During the transcription process, keywords that relate to slang terminologies have been unified and noted in the transcripts, as well as connections that relate to the supply chain in this specific context. For example, the word "oyma" generally translates to a certain type of carved wood; however, it is known amongst Damietta's furniture workshops as a local name for manual carving, with slang reference to carpenters working in carving as "oymagy" (singular) and "oymageya" (plural) – rather than the proper translation of "carpenter". Similar references to this have been identified, listed and coded, to ensure more relatable and accurate analysis (Table 6-1). Following this process, qualitative analysis was performed to extract the relevant factors and variables, as well as reiterate to the variables identified earlier from theory, to understand the overlaps and gaps between theory and context (Figure 6-2 - Semi-structured interviews process and analysis (developed by researcher from: *Gillham, 2005*)).

```
┌──────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│ Conduct  │     │          │     │  Data    │     │          │
│ face-to- │     │Interview │     │ editing  │     │  Data    │
│   face   │ ──► │transcrip-│ ──► │  and     │ ──► │analysis +│
│interviews│     │  tion    │     │reduction │     │synthesis │
│          │     │          │     │(retaining│     │          │
│          │     │          │     │authentic-│     │          │
│          │     │          │     │  ity)    │     │          │
└──────────┘     └──────────┘     └──────────┘     └──────────┘
```
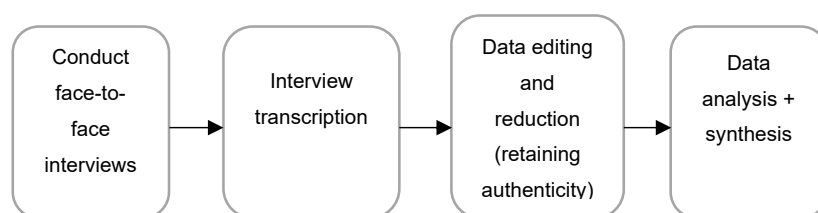
Figure 6-2 - Semi-structured interviews process and analysis (developed by researcher from: *Gillham, 2005*)

Table 6-1 - Terminologies Analysis and meanings in transcripts

Terms in Interview	Relevant meaning in Literature
Oyma	Carving
Carpenter	General term for workers with would, might include carvers, assembly workers and/or small workshop owners
Takhbeet Machines	Older generation of CNC (Computer Numerical Control) machines with less accuracy
CNC machines	Technologies used for 3D execution of carved designs
Taraye7 (plural) and Taree7a (singular)	Job orders per design. For example: certain bedroom design order
Eshra	Veneering
Oymagy (singular) and Oymageya (plural)	Carpenters working in carving
Eshtragy (singular) and Eshrageya (plural)	Carpenter working in veneering
Estorgy (singular and estorgeya (plural) Also called Sabbagh (less popular term)	Carpenter working in wood staining
Menaged (singular) and menagedeen (plural)	Carpenter working in upholstering
Makbas (singular) and makabes (plural)	Thermal compressors – used for compressing wood
Balady	A term for manual or oriental way of doing things (eg. makbas balady is a manual compressor)
Ablakash	Plywood
qahwa	cafes
Naddaheen (plural) and Naddah (singular)	Callers who market the gallery on the street
Damiettans / Damayta	Residents of Damietta who consider it home
"darrag" and "sahhab"	Types of hinges (a separate business) Darrag is pivotal Sahhab is sliding
El-kebeer	Family Head
7awya	Container (used as a reference to the amount of furniture sold)

6.2.2. Interviews Descriptive Analysis

Upon transcription of the interviews, preliminary analysis was conducted in order to form a view of the direction of the data and reflect on the following phase of the research. The following are word count and thematic analyses executed on the transcript, with highlights of the findings that arose from the analysis.

6.2.2.1. Word Count

The following table and word cloud (Figure 6-3 and Table 6-2) exhibit the most frequently used words by the interviewee, which indirectly highlight the important themes that were discussed. For example, the top mentioned words are "works", "workshops" and "factory", indicating that the significance of the scale of the different types of enterprises within the context of the industry in Damietta. Other important words that came at the top of the list are "machines", "business" and "Damietta"; the first indicates the significance of technology within the industry since the conversation constantly circled back to this theme, while the second and third related to the work pattern adaptation in the industry in Damietta and how this is highly connected to time (i.e. working hours, work intervals,... etc.). Technologies theme includes many subthemes that circulated around old versus new techniques and the social interpretation and willingness to adopt new technologies within this highly traditional industry. Business-related keywords arose as well, including "market" and "price". There was a discussion of how prices fluctuate affecting the businesses and stability of the market, as well as other economic discussions on current prices and the effect of each stage of the value change on the next regarding pricing. "Family" involvement was also discussed, and the keyword appears in the list, with diverging arguments of whether family involvement has a positive influence on the business as compared to working with contacts who are trusted but not family. "DFC" was also central to the discussions, where issues of the reason behind the project and how DFC is affecting the Damiettans in various ways were debated. Further interview analysis diagrams are included in Appendix 7.

Figure 6-3 - Word frequency diagram for interview transcript

Table 6-2 - Word count analysis of interview transcript

Word	Length	Count	Weighted Percentage (%)	Similar Words
work	4	328	3.69	act, acts, bring, bringing, brings, employed, employment, exercises, form, functioning, functions, going, make, makes, making, operation, operations, play, process, processes, run, running, runs, solve, solved, solving, studied, studies, study, studying, turn, turned, work, worked, working, works
workshops	9	149	2.11	shop, workshop, workshops
get	3	286	2.10	amazing, arrive, become, becomes, becoming, beginning, bring, bringing, brings, capture, catch, catching, causes, causing, come, comes, coming, contract, develop, developed, developing, development, developments, drawing, drawings, draws, experience, experiences, father, find, fix, generation, generations, get, gets, getting, going, grow, let, letting, make, makes, making, produce, produced, produces, producing, receive, start, started, starting, starts, stick, suffer, suffered, suffering, take, takes, taking
damietta	8	107	1.52	damietta
take	4	273	1.39	accept, acceptable, ask, asked, asking, asks, bring, bringing, brings, carry, carrying, choose, chooses, claim, considered, contain, contained, contains, deal, dealing, deals, demand, direct, direction, directly, engagements, exactly, filled, hire, hired, hiring, involved, involves, issue, issues, leading, learn, learned, learning, make, makes, making, need, needed, needs, pick, picking, remove, removed, rent, rented, renting, require, return, returned, selected, selective, studied, studies, study, studying, take, takes, taking, train, training, trainings
factory	7	88	1.25	factories, factory
business	8	102	1.19	business, businesses, engagements, job, jobs, line, lines, occupation
good	4	119	1.17	beneficial, commode, depends, experts, full, good, honest, just, practical, practically, practice, respect, right, skilfully, skill, skilled, skillful, skills, well
people	6	77	1.07	mass, people
want	4	102	1.06	lack, need, needed, needs, require, treasure, want, wanted, wants, wish
know	4	104	1.01	bed, experience, experiences, know, knowing, knowledge, knows, learn, learned, learning, live, lived, lively, living, loved, recognised

products	8	89	0.99	generation, generations, product, production, products, profit, profitable, profits
machine	7	74	0.98	car, machine, machines, organisations, organised, organising, prepared
different	9	64	0.88	conflicts, differed, difference, differences, different, disagreed, unlike
market	6	77	0.83	market, marketed, marketing, merchant, merchants, sell, selling, sells
lot	3	95	0.82	circumstances, deal, dealing, deals, distribution, drawing, drawings, draws, fortune, load, lot, lots, mass, mess, much, sets
now	3	67	0.82	direct, direction, directly, immediately, instantly, now, nowadays, present, presentations, today
industry	8	57	0.81	industrial, industries, industry
new	3	65	0.81	modern, new, raw, young
used	4	76	0.79	applied, applies, apply, employed, employment, exercises, functioning, functions, manipulate, practical, practically, practice, purpose, purposes, role, roles, use, used, useful, uses, using
one	3	55	0.78	one, ones, single
design	6	84	0.74	design, designed, designer, designers, designing, designs, figures, innovate, innovation, name, names, pattern, patterns, plan, plans, point, pointing, project, projects, purpose, purposes, show, showed
time	4	48	0.68	time, times
support	7	83	0.68	back, defending, documents, friend, friends, help, helpful, helping, keep, keeps, live, lived, lively, living, stand, suffer, suffered, suffering, support, supported, supporting
year	4	50	0.66	age, class, day, days, year, years
furniture	9	46	0.65	furniture
even	4	63	0.63	even, level, levels, regular, still, yet
price	5	47	0.61	cost, costly, costs, damage, damaged, damages, price, prices, terms
family	6	52	0.60	class, families, family, home, homes, house, household, inherit, inherited, menaged
old	3	45	0.60	old, older, previous, previously, sometimes
workers	7	42	0.60	worker, workers
create	6	68	0.59	create, created, creates, creating, make, makes, making, produce, produced, produces, producing
glue	4	39	0.56	glue, glues, past, paste, pastes
small	5	43	0.56	diminished, little, low, small
someone	7	39	0.56	person, personal, personally, someone
give	4	89	0.52	afford, applied, applies, apply, big, dedicated, established, generation, generations, gift, give, giving, hand, hands, open, opened, opens, pass, passed, passes, passing, pay, present, presentations, reach, return, returned
place	5	93	0.52	direct, direction, directly, grade, home, homes, investment, local, locally, location, locations, order, ordered, orders, place, places, point, pointing, position, positive, post, put, puts, putting, range, rate, send, sets, shoes, space, spot
started	7	83	0.51	beginning, first, going, original, originally, part, parts, start, started, starting, starts
galleries	9	37	0.50	galleries, gallery, head, heading
carpenters	10	35	0.50	carpenter, carpenters
clients	7	35	0.48	client, clients, custom, customer
make	4	99	0.48	build, building, buildings, builds, causes, causing, clear, construction, drawing, drawings, draws, established, fashioned, fix, form, give, giving, make, makes, making, name, names, prepared, reach, ready

6.2.2.1. *Word Trees*

Another analysis that was conducted is word trees based on important keywords. The following diagram (Figure 6-4) is an example of the word trees generated and other word trees can be found in the appendices of this document. Figure 6-4 sheds some light on interesting phrases in which "factory" was discussed. Some of the discussions included understanding the history of the family workshop/factory and the lifestyle that the participants had around this family business. Other discussed aspects were the work patterns of the workshops in relation to time, and how owners adapted to the workload by adjusting their working intervals. For example, if the work was halved, then the owner would work only half the week (as well as his employees). The supply chain and the types of workshops that coexist in Damietta was also an interesting thread. A much longer word tree arose from the keyword "workshop", which was not included for readability. Further analysis of themes regarding this keyword are added in below sections.

> *"Trust is much stronger these days than before. Contacts are definitely the priority at work. People care about who they know more"*
>
> *Subject A – Owner of Furniture Making Factory in Damietta*

Text Search Query - Results Preview
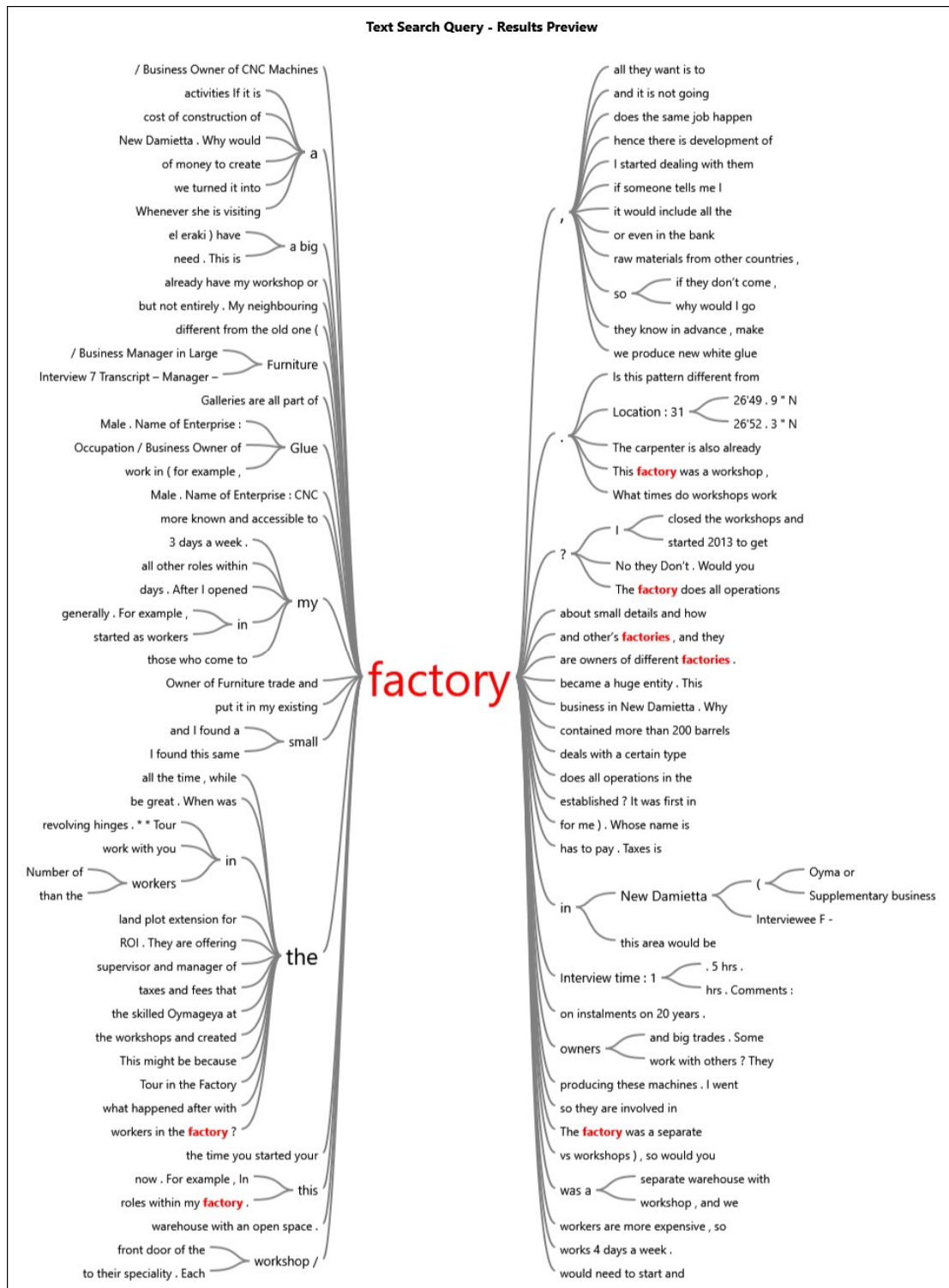
Figure 6-4 - Word tree for interview analysis based on the keyword "workshop"

6.2.2.1.   Interview Themes

The themes identified in the coding process highlight various aspects about the context, industry and social networks in Damietta. The following list comprises the themes in the transcribed text. Analysing the relationships between the different themes and branching out the overlaps, figures Figure 6-5 and Figure 6-6 show the content of the discussion of each theme and subtheme, and the percentage of interviews dedicated to each. The main themes that arose in the interviews were related to social capital, industry supply chain and life-work patterns in the city, and spatial distribution and patterns in the industry in Damietta. Other highly discussed topics included craft-related details and technologies, local and regional organisations relevant to the industry (DFC and CWWFI), and long-term family life in Damietta as related to the industry. There was mention of climate change and pressures on the industry and users on different scales as well.
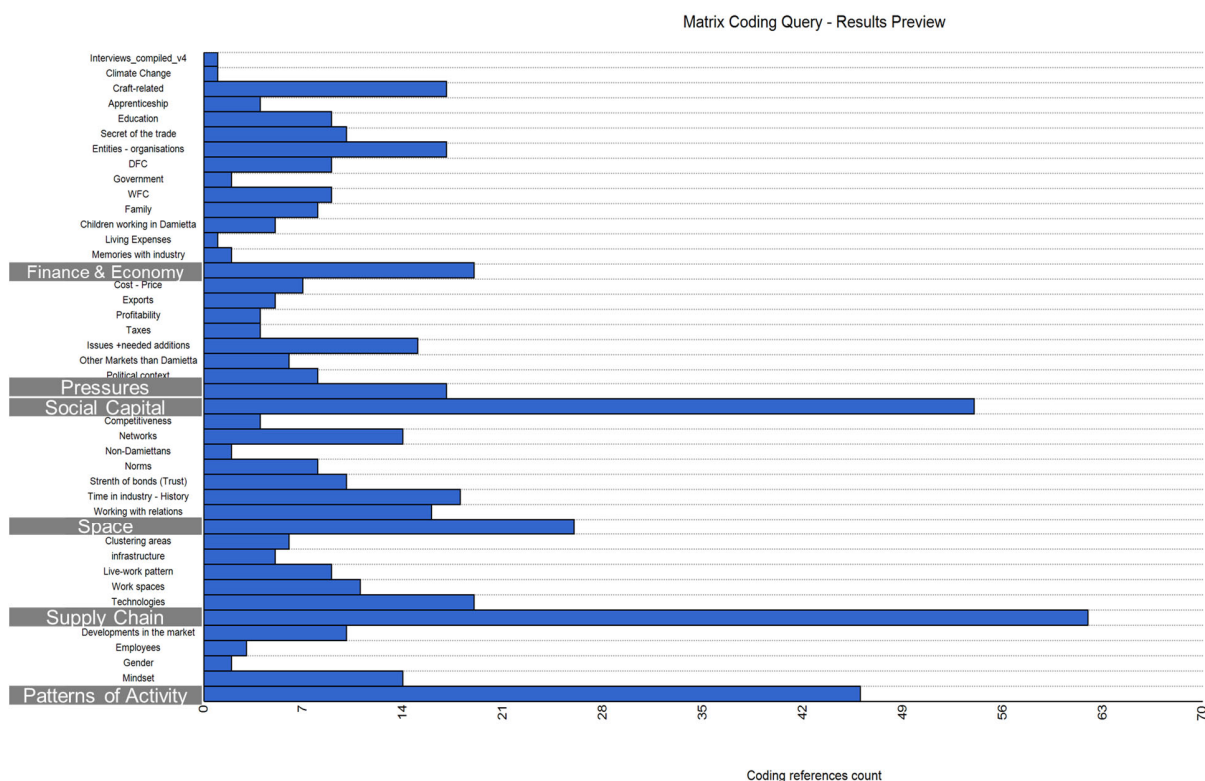
Figure 6-5 - Themes frequency analysis (source: Research analysis)
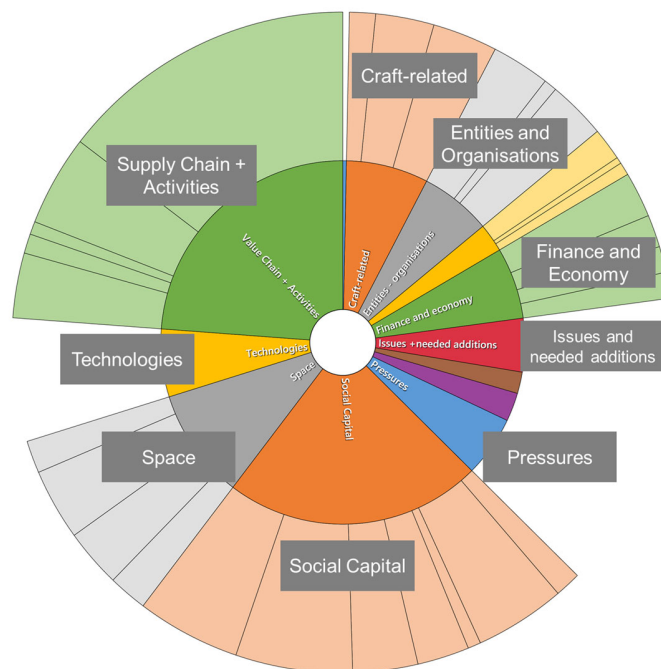
Figure 6-6 - Percentage themes discussions in interviews (Source: Researcher analysis)

The following Figure 6-7 exhibits the relationships between discussion themes and how different topics relate to one another. An example of such relations is the interlinking between pressures, needed development in the industry and political factors that were mentioned as a major concern for users. Another connection is between technologies, developments in the market and again the pressures posed on enterprises as a result of technology changes. Similarly, family-related themes intertwine with social capital and networks, in the sense that people's decision making in the industry is highly related to their familial relation to others working in the industry (whether positive or negative – this is explored below).

Further discussion of the content of these themes are explored in the thematic analysis in the following section.

Figure 6-7 - Nodes and themes mapping (Source: Researcher analysis)

6.2.3. Thematic Analysis

This section reviews and analyses the themes identified above with occasional reference to significant quotes that highlight key aspects.

6.2.3.1. Supply chain and Industry Activities

The discussions regarding supply chain and activities in the industry included various subthemes, such as the industry patterns and production line connections specific to Damietta, employment and workmanship dynamics in the industry, how users and enterprise owners think about their work as well as gender roles in the industry in Damietta.

The production line generally resembles the standard supply chain explored in literature (Figure 5-13), in terms of importing wood (as the main raw material), which is in turn to be sold to carpenters (or alternative/similar activities), which is then developed into finished product through a series of workshops and

activities (carver, veneerer, stainer and upholsterer). Nevertheless, this might be an oversimplification of the complex system in Damietta. The following Figure 6-8 illustrates the researcher's analysis of existing literature and information captured through the interviews in an attempt to comprehend the full extend of this complexity. Even through the production chain runs linearly in literature, the patterns in Damietta exhibit a highly nonlinear system. For example, design and carving (oyma) work hand in hand as the designs are made by the carver (oymagy) who would create the design as a 3D sample rather than computer drawings as in in usual furniture designs. This 3D sample (called mastara) is then taken for execution (whether manually by carpenter or through CNC (Computer Numerical Control) machines). Similarly, wood import sometimes has a middle stage of being sold through small merchants in the market to small workshops. The supply chain dynamics corresponds to a latter study also resulting from interview analysis on the existing patterns of work in Damietta (section 6.2.5). Two of these patterns are mapped in the figure below and mentioned in the earlier mentioned section with detailed analysis.

Some activities exist in multiple patterns. Transport, for example, varies according to scape of enterprise. For larger furniture trades and factories, enterprise owners usually own a truck for transporting their products and raw materials. For smaller workshops, there is a separate truck driver who delivers products and materials on demand through direct contact with workshops.

Another noteworthy result from the supply chain mapping was realising the missing activities in Damietta that exist in furniture industry production elsewhere. In Damietta, any quality control facilities such as value-added services and after sale support are practically non-existent. Vendors are expected to sell the furniture (a bedroom for example) with no liability whatsoever on after sale faults that might arise. It is considered part of high ethical norms to make sure any issues are fixed with someone's product, but it is not a service or standard that enterprises are expected to adhere to. Only largescale factories sometimes offer

after sale support, but this is also at the discretion of individual businesses. Similarly, "testing" as part of the manufacturing production line is also a missing activity. As each activity is done at a separate workshop, in addition to the fact that there is high reliance on the collective "expertise" in Damietta, furniture traders do not ensure the quality of the materials or products through testing, but through relying on trial-and-error transactions with different workshops to find the most reliable and high-quality craftsmen in each activity. There is testing within each activity as part of getting the job done, but there is no overall testing according to predefined standards to ensure quality. Marketing is also another lacking item on the chain, which related to the reliance on word of mouth and social capital. There was mention of some businesses using online marketing through forums and websites. However, this was mentioned in a negative light, as such "online vendors" are considered outsiders who know nothing about the industry, and only care about selling with no regard to quality or ethics of the craft. Marketing is available through galleries, which are usually owned by the same furniture factory to disseminate their products.
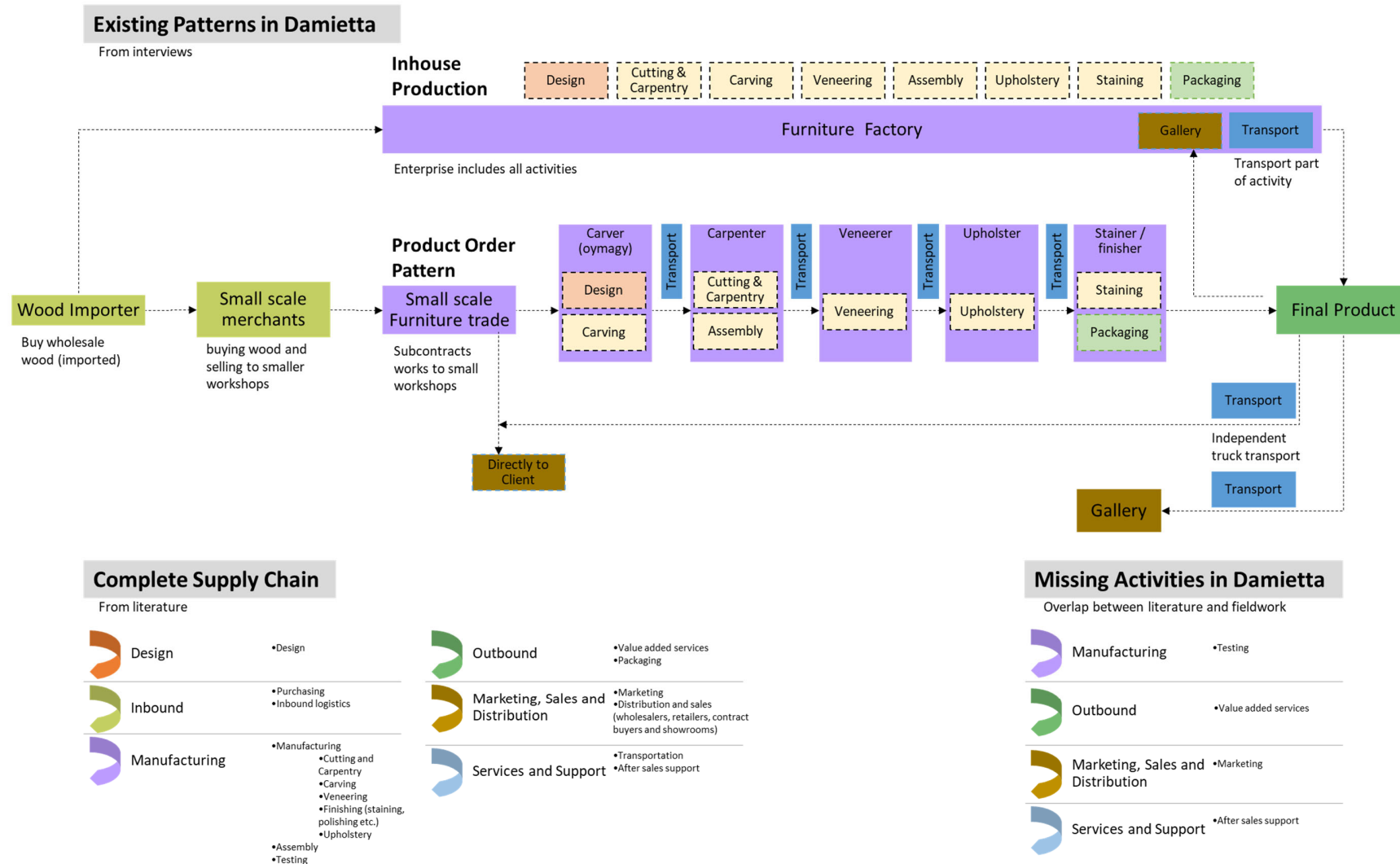
Figure 6-8 - Supply chain Analysis (source: Researcher Analysis)

6.2.3.2. Technologies in Furniture Making

Several respondents mentioned that the activities have evolved during the past decades especially with new technologies such as CNC machines. There are different arguments in this regard according to the angle and profession of respondents. Factory owners (who own and/or deal in CNC machines) mentioned such technologies has replaced the carvers (oymagy) in terms of creating a more efficient and timelier product with higher accuracy. For carvers, the perspective is that manual carving is higher in quality than any machines, as it has the creativity and talent of the carver 'engraved' in the work.

The current pattern is that many furniture trade workshops rely on carvers to create a design with 3D sampling (mastara) to be used even if they continue the production using a CNC machine or other machinery. Another pattern is that factories would hire carvers who might have closed their workshops or cannot find work as a technician on the CNC machines, and additional work this type of persons would do includes finishing the 'final touches' that the machine cannot do because of the fine scale of details (specifically with European neoclassical designs). Even with the CNC machines taking over most of the big factory work, factory owners would still prefer hiring a carver/oymagy than engineers or art graduates to manage the design and machine. The quotes below emphasise the controversial dynamic between carvers and CNC machines development in the industry.

From a social perspective, small workshop owners seem to have a resistance stance to new technologies and a preference of the traditional ways of the craft. This has in a way guided some of the norms that govern the whole system of the industry in the city.

> "*Being a carver (oymagy) is not only about dealing with the machine. They have intellect to create*"

> *Subject A – Owner of Furniture Making Factory in Damietta*

> "*CNC saves time, but it doesn't create the same quality of products*"

> *Subject D – Carver / Oymagy*

> "*A carver in my factory can do a better job than the designers who studied art and design, because he has a different perspective. My nephew studied applied arts, and he draws really well using computer software. However, when he first started doing work with me (designs), we started seeing disasters on the CNC machine when executing his designs. He is designing from the point of view of 2D drawing, but he doesn't take into consideration the depth of the machine, thickness of insertions and cuts, or any other details*"

> *Subject C – Furniture Factory Owner*

6.2.3.3. Social Capital

Discussions regarding social capital dove into various topics, including the history of the enterprises in the city, generations and development of social capital, trust and working with relations and friends, among other themes. These discussions relate to and even justify urban and social patterns identified in this chapter.

All interviews referred to their businesses as a **generational evolution** of their fathers' work. Most of them worked in the same activity/commodity as their father, while others chose to work in a different activity to complement their work in the industry. For example, The carver/oymagy mentioned his father was a veneerer, and he chose to do oyma instead because he wanted to go into a different line of work. He now refers clients to his father's workshop and vice versa, while his younger brothers have the choice to work with either himself or their father. Other interviewees mentioned they continued and grew their father's workshops in the same line, especially in furniture trades and factories. The younger generations among MSME owners expect to go into the business as well (minding the difficulties and pressures posed on the industry today). For bigger factory owners, some of the younger generation are studying business management rather than the craft in order to manage the large-scale enterprise. This is justifiable as there are employed workers and engineers for each activity who are already handling the industrial part. This latter pattern is the more generic approach to industrial enterprises, where institutional social capital would apply rather than familial and long-term community relations as in the case of small workshops in Damietta. Some of the businesses went back to the 1940s as a starting date for the father's enterprise. The reflection of these actions on the pattern of workshops development in Damietta is explored in detail below (section 6.2.4).

In terms of **preferences in work transactions** as well as employing others in their business, it was clear that workshop owners would prefer and prioritise quality of the work, followed by preference of working with individuals they know

and trust. This trust can evolve from trial-and-error business interactions to test the quality of product/activity, or could be through familial or friendship referrals. This also applies to passing down the skills and knowledge through training, where usually apprentices would be relatives (nephews) or sons of old friends.

Apprenticeship and passing down the "secret of the trade" is another important discussion that goes hand-in-hand with **competitiveness**. The industry market in Damietta prevailed as a rather competitive environment, where workshop owners working in the same craft would seamlessly grab any opportunity to do the same work for a lower price in a normal conversation with a client or even a friend. That said, dealing with the "secret of the craft" seems to be different for small workshops rather than for larger factories. In small workshops, taking on apprentices is normal and occurs regularly, especially with relatives and friends. A carver would welcome passing on the knowledge to his apprentices, as this would ensure more production with high quality. He would even encourage them to grow into subcontracting orders for him as a way of support. For larger factories, they are more protective of their designs, work and final touch of their products. Owners would be careful to make sure they trust the right workers to employ and teach. Their worry is that part of the skills is their client lists and marketing strategies (intellectual capital). Hence, an unworthy worker could learn the trade, and sell similar quality work for a lower price (as he wouldn't need to pay taxes or other overheads as they do). It would be safe to say that threat of new entrants into the market is much higher in factories rather than in small workshops, as their strategies and approach to competitiveness are distinctly differently. Factories focus on differentiation as the main strategies for having a competitive advantage, while small workshops target cost leadership (Porter, 1985).

Working with relations (friends or family) is a significant pattern in Damietta. It is worth mentioning that enterprise owners appear to prefer that members of the family would work in different activities/crafts, where they would complement one

another and refer clients as previously discussed. When siblings inherit the father's business and start working together or become competitors, business transactions affect familial relations, and in many cases, the solution was to separate businesses. Even though families in Damietta work collectively in the industry, with high prevalence of transactions based on familial relations, the opposite also exists, where brothers or cousins choose to stop working together on purpose to avoid family trouble.

Regarding **trust**, this is considered to be a significant currency in the industry in Damietta (as explored in Chapter 3). Interviewees stressed the importance of trust between them and their clients or others in the industry they work with. There was one reference to the "enterprise owner's right" for me to keep the secret ingredient/edits product the interviewee produced for him private, with little care to personal gain if he used these edits with other businesses. The same applies to supporting furniture trades a given factory/workshop deals with against rivals, which applies more to supplementary activities such as glues or middlemen (which can sometimes be the same person liaising between furniture traders).

> "*I helped distribute his work/products, so if I support his rival, I am hindering his work*"
>
> *When someone asks me for the same paste I did for another business, I tell them I have to ask the other guy first. I can't just give them the same paste knowing they would go and clash with another client of mine's territory of work*"
>
> *Subject B – Owner of Glue Factory*

Discussions on **norms** in the furniture industry in Damietta revealed patterns of the collective mindset of the industry community. This included the earlier mentioned sense of competition between those working in the same craft, where the thrift towards lower price and higher quality. There is also a strong collective appreciation of ethics of the craft, and a selective culture of locals working in the industry. Outsiders are known, and there is a strong culture against including outsiders. This includes Syrian nationals residing in Damietta, who were mentioned as short-term businesses that only pursue profit over longevity of transactions in the market. This is a similar case to vendors who do their business online without "proper" relations to the local industry community. Familial influence is also one of the still existing norms in the community, where a given elderly in a family can choose to take to the role of peacemaker to resolve feuds or business disagreements between workshop owners. This is by choice rather than obligatory norm; however, the discussions by elderly are respected and decisions agreed upon within these discussions are honoured by all parties involved. One negative aspect that was highlighted by the interviewees were their passive or negative views on collective work by all enterprises supporting the betterment of Damietta's industry. There seems to be low belief in the ability to work together towards a bigger goal, especially with the current economic and political pressures on individual enterprises in the industry and city.

Networks tie into a number of these earlier conversations, as all relations reflect on the type of dynamics of the total social capital network in the industry. In terms of magnitude, it was mentioned that on average, a workshop owner would know more than a hundred other workshops in the field, and the same goes for factories. In discussions with interviewees about people they know, there were always overlaps between contacts mentioned, whether the same person or another person from their family. Interview discussions clear exhibit that networks in the industry overlap and intertwin both socially and business-related. There was also mention that networks work simultaneously, so at any given point,

a furniture trader would be dealing with 2-3 carpenters, each through different production orders. This smaller network would evolve and change according to quality of products and a filtration process by the trader/factory, who would either continue to work with the same carpenters or ask common contacts for new carpenters to work with. This is also applicable for different types of activities.

6.2.3.4. Pressures and Needs Within the Industry

Within all interviews, there was conformity between respondents on the magnitude of economic and financial pressures posed on enterprise owners in Damietta. Discussions in this regard revolved around the unprecedented fluctuations of prices of materials, which in turn affects the prices of the product, as well as affects existing deals traders have agreed on before each jump in the prices. There was also mention that work has become much less in quantity (deals, orders and general flow in the market), as compared with 10 years ago or more which coincides with the time of the 2011 revolution in Egypt and the political aftermath during the last decade in the country. Some interviewees did make the connection and mentioned that political pressures are also a factor, connecting this to the new Damietta Furniture City (DFC) project.

There were some gaps mentioned as well regarding the production/supply chain in Damietta (examined above in section 6.2.3.1), which reflect needed aspects in Damietta and in the industry. One of these is marketing, which has been identified by interviewees as a lacking area as the compact nature of the city. The way workshop owners rely on word of mouth and social relations does not allow for other marketing strategies to evolve within this context. Even online marketing is somewhat stigmatised as an "easy way" with less knowledge. Most clients would arrive directly to visit a workshop they are targeting but discovering new workshops would be quite hard to manage for non-Damiettan clientele. Another highly vital aspect that is missing in the industry now is proper business management, specifically for small workshops. It is believed by many to be the reason for the closure of various workshops as they go bankrupt. For smaller

workshop owners, comprehending the business management needs of the enterprise and evaluating profits and losses seems to be lacking. MSMEs in Damietta would generally proceed annual comparison to the year before on the amount of work or production done in this year, and this would be the basis of seeing whether they did well during the year. However, with the fluctuating prices, unsteady market and seasonal nature of the industry, this becomes complicated and there is a need for business planning, feasibility studies or even simple computational registry. These might be challenging for many of the enterprise owners who might be uneducated and working on their own in the workshop.

Conversations on what respondents believe as solutions were quite interesting to collate. The main focus that was repeatedly mentioned was the need to focus on the old city in terms of development rather than create new settlements, industrial areas and infrastructure. The infrastructure of Old Damietta could be developed into efficient service for the industry with limited budget. Another aspect that arose was education and how that needs focused attention to link academic institutions to on-ground patterns of work in the industry in Damietta.

> *"A carver with proper industrial/engineering education would do wonders in the market"*
>
> *Subject A – Owner of Furiture Making Factory*

6.2.3.5. *Spatial Distribution of the Industry*

Interviews targeted the spatial distribution of the industry in Damietta city, which informed the geospatial mapping in this research. The mentioned areas of concentration of activities were highlighted on the below map (Figure 6-9). It is noticeable that spaces that are well-known for concentrations are usually related to a street name (AbdelRahman street, El-Shoara road, etc.), where the main

enterprise concentration roots on this street, and branches to the area around it. It is also notable that staining workshops are quite significant in the supply chain, and El-Shoara area is renowned in the region for having a cluster of high quality stainers. Galleries and marketing enterprises that might be connected to other workshops elsewhere in Damietta region are concentrated on the main roads at the entrance of the city, which is a strategic location for clients coming by vehicle from outside Damietta to be able to easily find the enterprise.

Figure 6-9 - Furniture Industry Concentration areas in Damietta City (source: Interview Data)

6.2.3.6. *Local and Regional Organisations*

When asked about external organisations related to the industry in the city such as the **Chamber of Woodworking and Furniture Industry (CWWFI)**, the responses were neutral on their role in the development or support of one's

enterprise or business. There was mention that CWWFI provides trainings for enterprise owners and workers, but with little enthusiasm about the effectiveness of the content. It was also mentioned that these trainings are not well marketed or known within the industry community. CWWFI's role in national furniture exhibitions was highlighted, with little or no mention of support given to enterprises to take part in such events. Larger businesses and factories would keep a light relationship with representatives from CWWFI for political correctness and for possible business transactions that they could get as a result.

Damietta Furniture City (DFC) is the other major organisation in the region, although different in nature from CWWFI. DFC is a controversial mega project development by the government as a furniture making hub (further details in literature in Chapter 2 and Chapter 3). The mention of DFC for all interviewees was met by negative connotation and a sense of desperation. Interviewees wondered about the reason for the project, as it practically duplicates their existing workshops and factories. Combined with the discussions about pressures in the industry, the prevalent theme revolved around fear from losing more work or going bankrupt after DFC takes on all their work. Any discussions on DFC project circled back to the economic problems facing the city and even general issues about the Egyptian socio-political landscape. There were also discussions around the design of DFC and its location, where factory owners mentioned the ROI for building a factory there would be negligible compared to their current enterprises in Old and New Damietta cities. The location of DFC was also questioned as the soil is allegedly unsuitable for building, which would imply much higher costs for the construction. Additionally, the designs of the hangers in DFC (according to interviewees' testaments) neither fit workshop patterns nor can accommodate a large factory setting and needs. At the same time, small workshop owners are worried because they cannot afford to buy in DFC, while they are under threat of losing what is left of their business because of it. All these aspects circle back to the questions posed in Chapter 1 of this

research on the role of DFC and its integration into the existing well-established furniture industry cluster in Damietta.

6.2.4. Urban Patterns Analysis

During the interviews, one of the most interesting discussions was about the home-work pattern of the expansion of the cities in the past decades. A given resident invests in purchasing a land plot in the city and builds a workshop on the ground floor with his residence on the first floor. This would ensure efficiency and comfort in handling work issues, as well as security of logistic paperwork, which is usually kept in his residence. As the family expands with children, the owner can add an extra floor to cater for this expansion. The children usually work with their father in the workshop, where they learn the craft and get introduced to the network in the neighbouring workshops. When a member of the second generation decides to get their own business, the original owner gives part of the ground floor to him (male-dominated community) for this activity, where the expansion of the residential component follows. In other cases, the second generation choose to invest in independent businesses by investing in a new piece of land, hence contributing to the horizontal expansion in Damietta.

It is worth mentioning that the whole process is highly male dominated. Owners of the original workshop usually want their male children to continue working with them in the business, while in the case of their female offspring, the encouragement is towards getting married -usually to another trusted workshop owner who would have their own similar cycle of ownership and development of the building pattern.

1

Small workshop, where the owner lives in a near plot (usually the one next to it).

2

Workshop on ground floor and the floor above is the residence of the owner.

3

After the expansion of the family of original owner of the business, the second generation take ownership of part of the ground floor for another business. The upper floors are residential for the family (first & second generation).

4

This is a bigger business (usually comprises a gallery), with more than one floor on the ground level as commercial. The residential part is also on the top floors.

5

This is a bigger business (usually comprises a gallery), with all the front elevation being commercial. The residential part is on the back side parallel to the commercial.

Figure 6-10 - Different patterns of mixed-use buildings in Damietta (source: Author)

5

One or more of the owner's children choose to invest in another land plot and start the same process in another location.

1

Carpenter buys the land and builds workshop on ground floor along with his home on the first floor.

2

Owner builds upper floor(s) for expansion of his family. His children join their father in the workshop.

3

As the next generation thrives to have their own workshop, the owner gives part of the ground floor for his grown son(s) to open a workshop (most of the time in a different craft within the industry.

4

The expansion of the second generation might happen in the same location, with marrying and children, hence the need to build further floors.

Figure 6-11 - Development of home-work pattern and its effect on the development of the urban fabric (developed by researcher from interview data)

Another remark about the urban fabric in Damietta related to scale. The scale of land plots is relatively small and the road infrastructure is equally small. The majority of the land plots in Damietta are between 200 and 400 m^2 (see map in Figure 6-24), which makes the development of the city quite compact and vertical in relation to the land area.

6.2.5. Furniture Industry Patterns Analysis

One of the important outputs of the interviews was mapping the supply chain in Damietta's furniture industry, as well understanding the process through which social actions occur among actors (business owners) along the chain. There were patterns that emerged from the overlap between literature on the supply chain, examining interviewees perceptions of how they work and observations from the field.

Three patterns of work were concluded as a result by which the production process takes place highlighted in Figure 6-12 below; ***1) Enterprise sequential process*** (Figure 6-12 A) through which the product is transported from one workshop to the other along the supply chain until being finally sold at a gallery, ***2) Product order-based*** (Figure 6-12 B), where one central business owner orders out pieces of the final product (stages) from different trusted partners, given that the final assembly and selling would take place within the central owner's enterprise, and ***3) Inhouse process*** (Figure 6-12 B), which is only adopted by major enterprises in the market (top category within MSMEs classification), where the whole process takes place within the enterprise without needing partners.

All interviewees have directly or indirectly referred to one or more of the abovementioned patterns, whether it was their own adopted way of work, or their relation to other enterprises in the industry. Some of these mentions of the different types of patterns were clearly raised in statements such as:

> " *Within our family, there is a carpenter, an upholsterer and a wood polisher. Whenever one of us receives work, we contact each other for collaborating on it, each in his own workshop. You usually don't want all the family working on the same craft* "

Subject D – Carver / Oymagy

> " *I only collate the final product in my workshop now. As soon as I receive a furniture order, I have trusted people I know within each craft whom I trust for good quality parts of the furniture, like chair legs, bed headboards… etc* "

Subject E – Furniture Trader / Distributor

> " *We don't need to outsource anything to other enterprises. We do everything inhouse here in our factory. However, even though I don't need to send out all my work to others, I still send some orders to my friends and contacts from time to time. We don't live alone, and it is important to share resources with others* "

Subject F – Manager of large scale Furiture Making Factory

The most prevalent and long-term tradition of social capital exchange was always between the first type, *enterprise sequential process* (Figure 6-12 A), where concepts of reciprocity, referral and business intermediaries are highly used between enterprises. One of the interviewees owned a glue factory, which represents an important supplementary commodity to the supply chain and discussed how his role was not only related to his own business transaction, but to facilitate between carpentry enterprises, galleries and wood suppliers. One of the emphasised ideas mentioned was how the "un-written" contract is to be honoured by all parties within the transactions, including not selling to competitors if an oral bid was placed, for example. The interpretation of time in this last example signifies the importance of trust as a currency, where no monetary exchanges occur in many cases of oral bids, which circles back to the significance of referral and the significance of a trusted word.
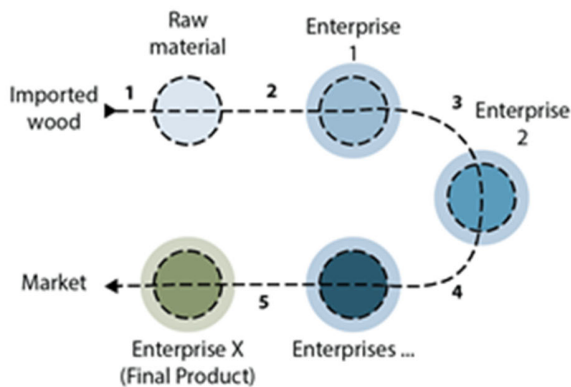
Enterprise Sequential

Product is transported from one workshop to the other along the value chain until being finally sold at a gallery.

Entails urban spatial interaction.

Used in Damietta in some cases. Exerts some Social Capital.
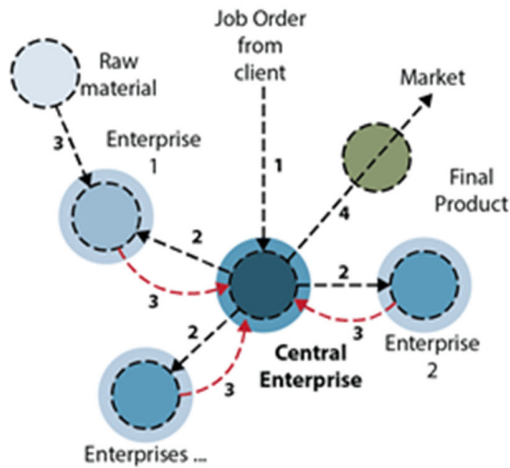
Product Order

One central business owner orders out pieces of the final product (stages) from different trusted partners, given that the final assembly and selling would take place within the central owner's enterprise.

Requires proximity and a dynamic urban spatial interaction.

Most used in Damietta.
Exerts Social Capital as a currency of trust and long term relations.
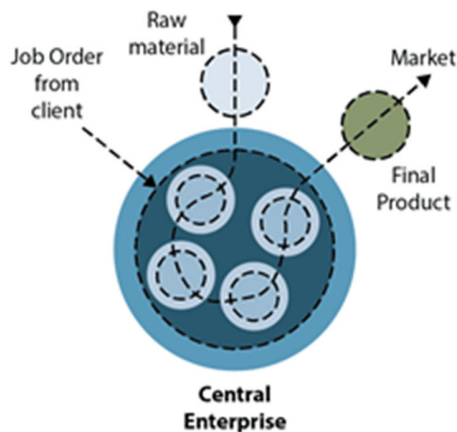
Inhouse

Adopted only by major enterprises in the market (top category within MSMEs classification), where the whole process takes place within the enterprise itself without the need of any partners.

Isolated. No spatial interaction.

Used only by major enterprises. Sometimes major enterprises resord to other patterns to keep tradition of Social Capital and relations.

Figure 6-12 - Patterns of Supply chain processes in Damietta's Furniture industry (Source: Author results) – sub-figures A, B and C top to bottom

Within the second pattern (*Product order-based*) (Figure 6-12 B), social capital appears as assets of the "contracting party" who liaises the different orders with enterprises. In this case, the dimension of networking comes in action where a single business-owner's network substitutes many logistic and monetary transactions with other enterprises along the supply chain. Interviews reveal emphasis on having an average of 300 contacts within the city of Damietta to properly carry out sustainable business transactions. Within bigger-sized enterprises, these contacts are mainly business acquaintances, while in smaller entities, more family-based contacts are found.

The third typology (Figure 6-12 C) is a rather independent party in the industry, where almost all processes do not involve dealing with other enterprises. However, interviews with large scale business-owners showed that they prefer to mix up their way of work, where they sometimes switch to other processes typologies, as a personal preference, which allows them to be part of a social cohesion approach of "profit and let profit", keeping strong bonds with their trusted neighbours and friends who work in the field.

Skill transfer within the industry in Damietta also happens in a social capital related pattern, where the new generations of families are encouraged to step into the business. The use of long-term relations is widely used to access opportunities for work, training and gaining more knowledge in a certain commodity, where people hire or train individuals who were/are referred by trusted contacts. This related to each enterprise trying to secure their "secret recipe" to their product, where they do not just want to hire skilled workers, but rather "trusted" workers who could be taught later on and evolve in terms of skill.

Another layer of analysis on the above patterns was conducted exploring the overlap between the unveiled supply chain typologies/patterns in Damietta and social capital dimensions, to identify which pattern is most abundantly found in Damietta and exhibits high magnitudes of trust, networks and norms (Table 6-3).

Table 6-3 - Social capital dimensions analysis in Supply chain typologies
(Source: Author's interpretation of results)

Supply chain pattern/typology	Frequency of pattern in Damietta	Social Capital Dimensions		
		Trust	Networking	Norms
1. Enterprise Sequential	Highly abundant	Medium - needed	High - needed	High
2. Product Order	Highly abundant	High - needed	High - needed	High
3. Inhouse	Few large enterprises	Selective (according to owner)	Optional – preferred	High

From examining the overlaps between supply chain typologies and social capital dimensions within the interview data, it can be deduced that Product Order pattern exhibits the highest social capital magnitude. This pattern requires a high level of trust between the core enterprise and the supplementary ones. It also requires high networking capacity in order to hire appropriate skills for the different activities, in addition to the industry norms that are abided by in all patterns within the city. Enterprise Sequential pattern also exhibits high social capital, with less need for trust, as enterprises deal primarily with adjacent activities to them along the supply chain, with no need for trust in a wider circle.

Since the majority of enterprises in Damietta are MSMEs, they all operate within one of the two primary patterns identified above (Enterprise sequential or Product order). This intrinsically affirms this thesis's initial hypothesis on the abundance of social capital and its influence in the market in Damietta, as almost 99% of furniture enterprises in Damietta (Table 5-9) operate within a supply chain pattern that incorporates high social capital within business transactions.

6.3.   Urban Observations

Observing the different patterns of mixed-use buildings and commercial buildings, the following patterns existed simultaneously within the three zones identified in the map in Figure 4-9, which were the basis of the analysis of building patterns and scales introduced in Figure 6-10.

Area 1: Compact fabric (in city centre)

Figure 6-13 - The compact fabric of the internal streets of the city centre
(source: Author)

Figure 6-14 - Left: Small workshop on ground floor with no upper floors while
the building next to it is completely residential. Right: Ground floor workshops
with residential floors on top, utilising outdoor space as storage (extension of
the workshop). (Source: Author).

Area 2: City Peripheries close to main road entrance to the city

Figure 6-15 - The main street on the periphery of the city (source: Author)

Figure 6-16 - <u>Left</u>: Ground and first floors are commercial with 4 residential floors on top. <u>Right</u>: Highrise building with almost half of it as commercial (3 floors) with 6 residential floors.

Area 3: Waterfront

Figure 6-17 - Waterfront in Damietta - Mixed-use buildings (source: Author)

Figure 6-18 - <u>Left</u>: Small scale mixed-use building with ground floor workshop and 2 residential top floors. <u>Middle</u>: Large scale mixed-use enterprise with 4 floors dedicated to workshop/gallery and three residential floors – <u>Right</u>: The whole façade is commercial while the residential is on the back side of the building (source: Author)

6.4.   Damietta GIS Data Analysis (Existing Dataset)

During the first phase of data collection, GIS map of Damietta was acquired from CAPMAS (Central Agency for Public Mobilization and Statistics) containing current information about Damietta's population, land use, ownership as well as demographic data according to census data 2017. This data is analysed in the following section as an approach towards reading the current patterns of city, and how that would support or counteract the argument presented in this research.

6.4.1. Administrative divisions

The following maps (Figure 6-19 and Figure 6-20) of the administrative divisions illustrate that the study area sits within three main districts (Damietta One, Damietta Two and Central Damietta), with smaller divisions of 5 neighbourhoods. It is worth mentioning that these administrative boarders do not reflect on urban characteristics in the general sense. Hence, the residents do not identify as living within a certain neighbourhood, but rather to street names or to "Old Damietta" in reference to living in New Damietta, which is an extension of the city to the north (not discussed within this research).
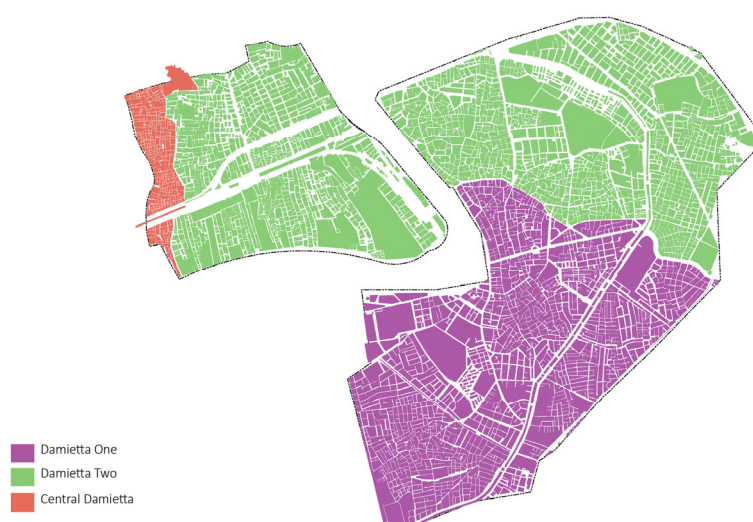
Figure 6-19 - Damietta city study boundary and Administrative divisions on macro scale (Source: *CAPMAS, 2019*, developed by researcher)
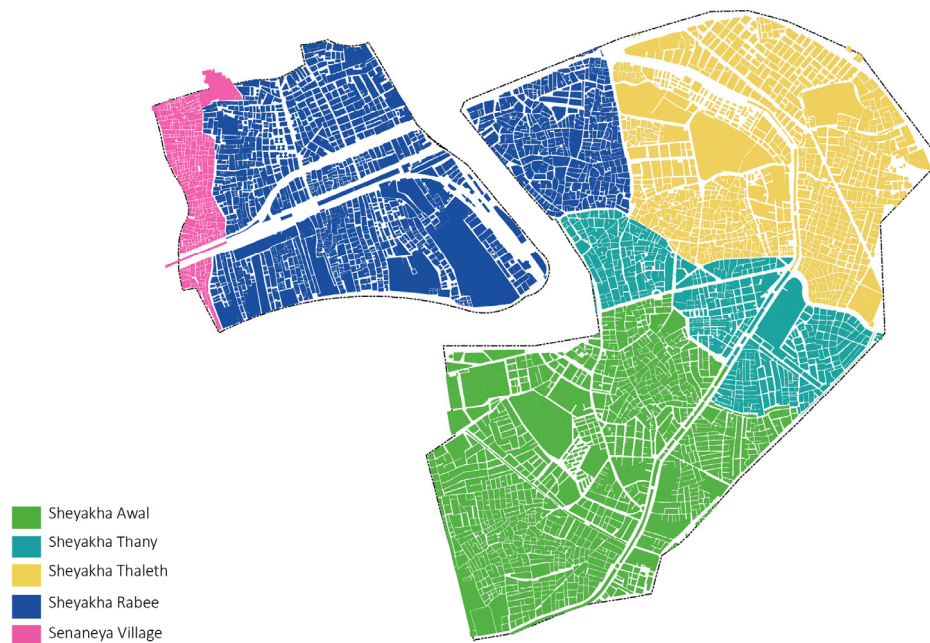
Figure 6-20 - Damietta city study boundary and Administrative divisions on
micro scale (Source: *CAPMAS, 2019*, developed by researcher)

6.4.2. Building Typology and Land Use Patterns

Observing building typologies within Damietta (Figure 6-21), it is instantly
apparent that most of the urban setting consists of different types of residential
buildings. From apartment buildings to rural houses and villas, the common
theme is the scattered distribution of services within a largely residential fabric.
At the Southern end of the Nile corniche, an area of governmental buildings is
located which comprises the city municipality building with other logistic services
around. The opposite side (western) of the city, called Senaneya, has much less
services and commercial access than the eastern side of the city.
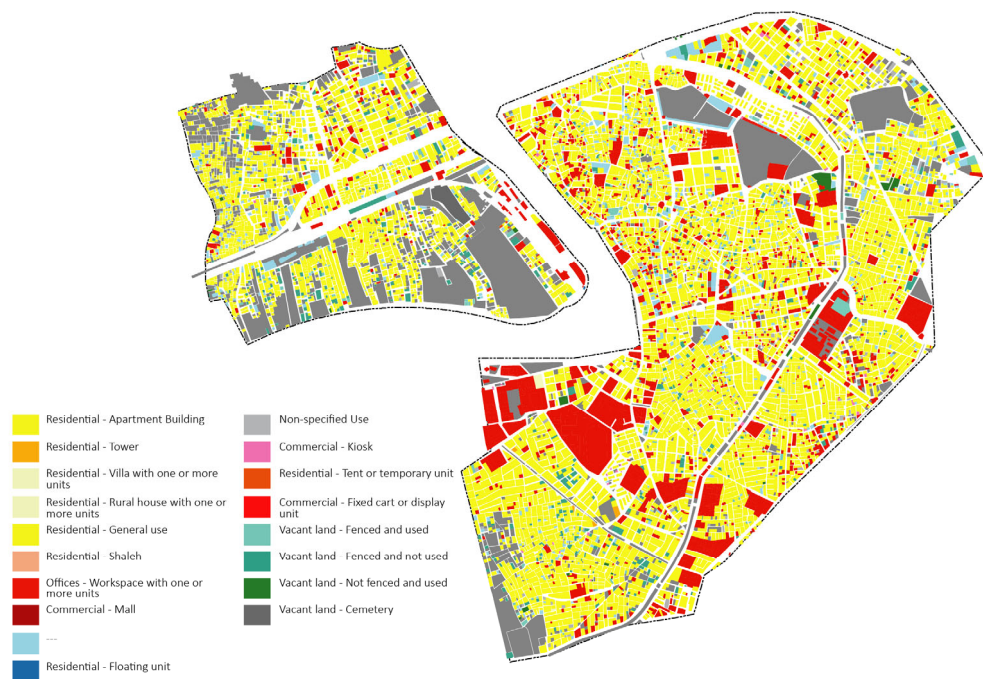
Figure 6-21 - Building Typologies in Damietta (Source: *CAPMAS, 2019*, developed by researcher)

Analysing building typologies as compared to land use map (Figure 6-22) reveals an interesting perspective of the city, which is the abundance of mixed-use residential buildings all through the city, and their high concentration in some central areas along the Nile. This supports the pattern of living that was explored in the interviews and systematic observations, illustrating how residents of Damietta exhibit a unique home-work pattern, living right above their workshops and managing their work from home. More mixed-use buildings are found within the central area of the city and as we approach the peripheries of the study area, the fabric becomes more purely residential. This could be seen as a reflection of the pattern of expansion of the city over the last decades, which can be seen through observing the age of the buildings (described by the year of constructing the oldest part of the building) in Figure 6-23 below.

Residential
Commertial
Mixed-use
Vacant - Not used
Closed - Not used
Under construction
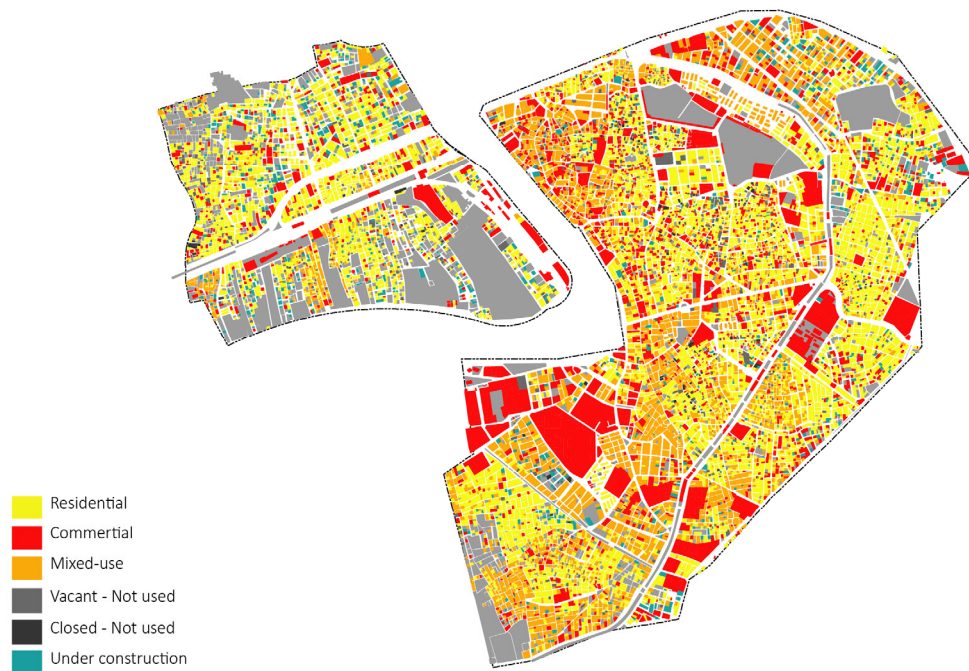
Figure 6-22 - Land Use Map of Damietta (Source: *CAPMAS, 2019*, developed by researcher)

Before 1944
1945 - 1979
1980 - 1999
2000 - 2009
2010 to present
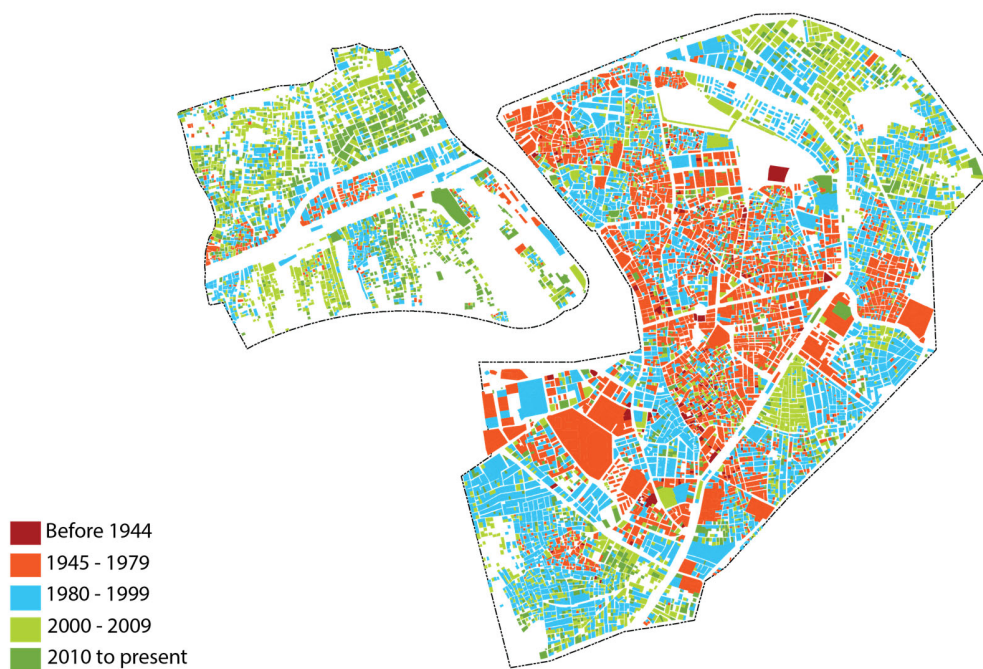
Figure 6-23 – Date of construction of oldest part of the building (Source: (CAPMAS, 2019b), developed by researcher)

6.4.3. Urban Fabric

The map in Figure 6-24 is a direct indicator of the scale of compactness of the city of Damietta. The majority of plots in the city are between 200 and 400 sqm in area. Given the organic distribution of the urban setting and the also compact scale of the infrastructure, it is safe to deduce that proximity is a vital factor to consider within this research. Whether proximity facilitates or hinders social capital relations and business transactions between people is to be examined through the survey.
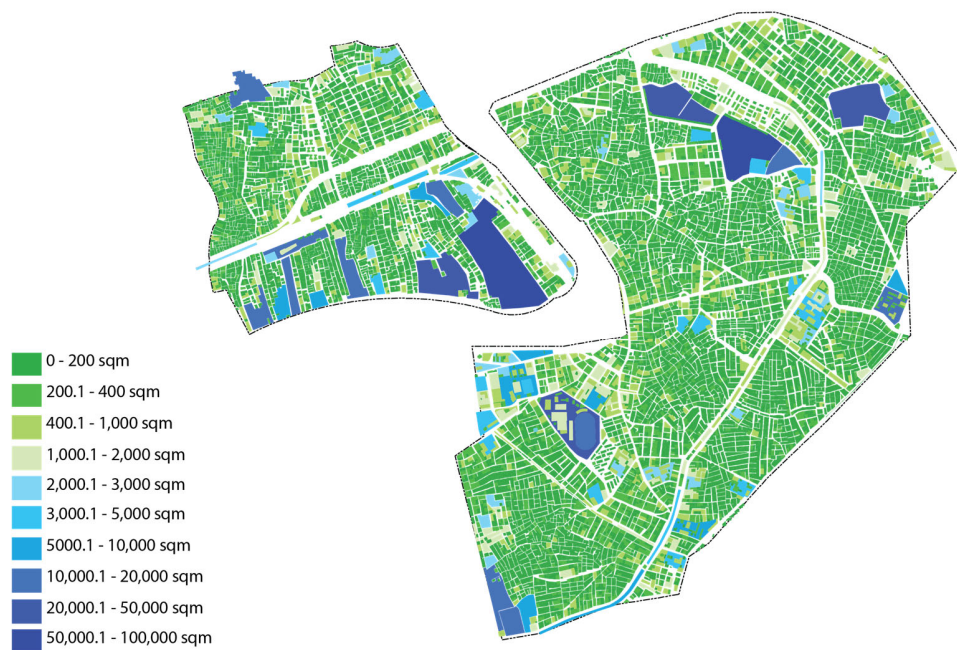
Figure 6-24 – Map of land plot areas in Damietta (Source: *CAPMAS, 2019*, developed by researcher)

6.4.4. Demographic Patterns

The distribution of residents in Damietta is highly reflective on its socioeconomic context. The map in Figure 6-25 shows that the majority of plots in Damietta contain 1-5 households, with exceptions of some buildings that comprise up to 10 households. This is in line with the urban pattern explored earlier in section 6.2.5, which highlights that the households within a building are usually the

original owner and the families of the second generation of owners. Following expansions would take place through investing in a new land plot and starting a new cycle. This also lines up with the mapping of number of family members per household, which reveals that almost half the city lies within the upper category of 4-10 members, meaning that half the residents have 2-8 children. This is important to consider when reflecting on the work pattern adopted in Damietta, as children are highly encouraged to join the family business, and sometimes forced into it by social norms or family obligations (which was also discussed in some of the interviews).
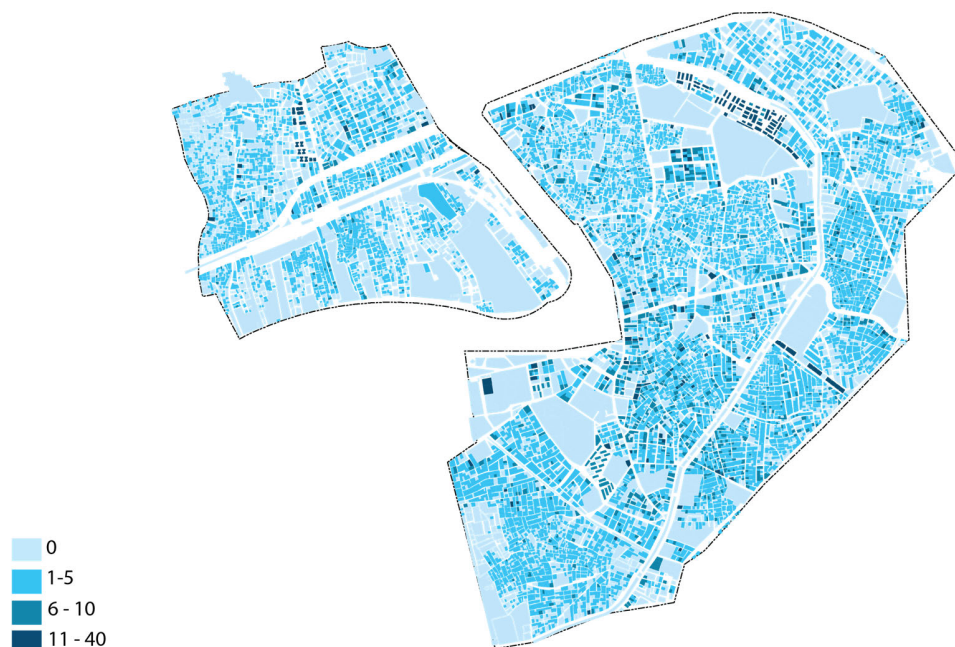
Figure 6-25 – Number of households per building (Source: *CAPMAS, 2019*, developed by researcher)

Figure 6-26 - Number of Family Members per household (Source: *CAPMAS, 2019*, developed by researcher)

6.4.5. Built Environment Infrastructure Status

The built assets in Damietta's fabric are generally in good state given its rural nature as a small settlement. When considering the building status as a reflection of need for renovation, the following map (Figure 6-27) shows that the majority of the infrastructure is structurally safe or in need of minor renovation. Some specific areas need major renovations, which indicate structural risk. This might be due to the age of the structures or may relate to the expansions that took place over the years, posing structural pressures on the buildings.
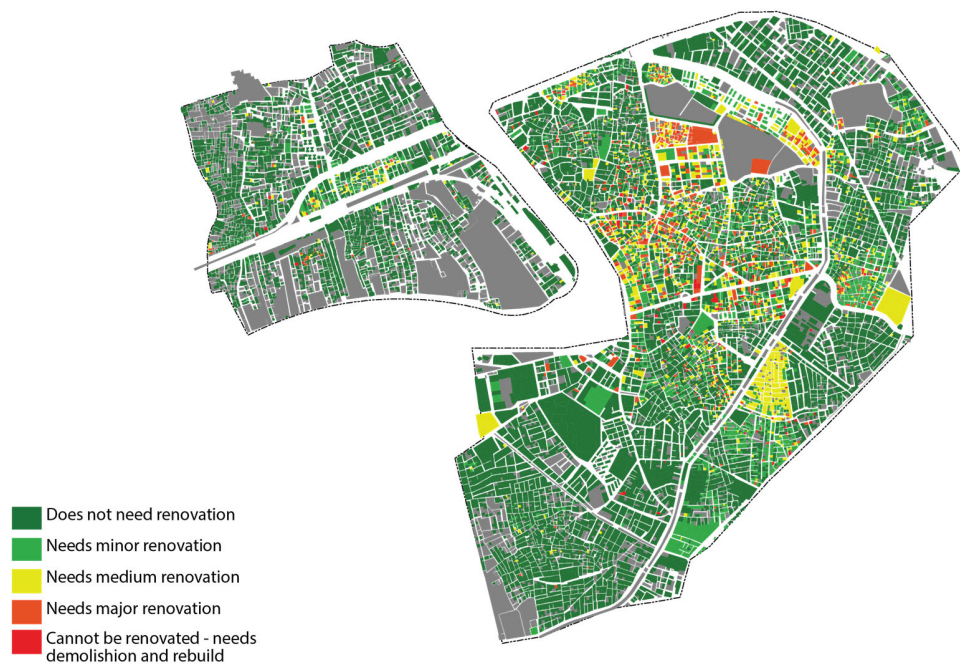
Figure 6-27 - Built Environment Status - Need for Renovation (Source: *CAPMAS, 2019*, developed by researcher)

6.4.6. Ownership

This is an important variable which reinforces the argument posed in this research. The following map (Figure 6-28) exhibits ownership of land plots in the city, and it is almost entirely privately owned by residents, except for public buildings and services owned by the government. The reflection of this ownership status is a social sense of "ownership" and "belonging" that each resident has towards their property, including their home and workshop alike.
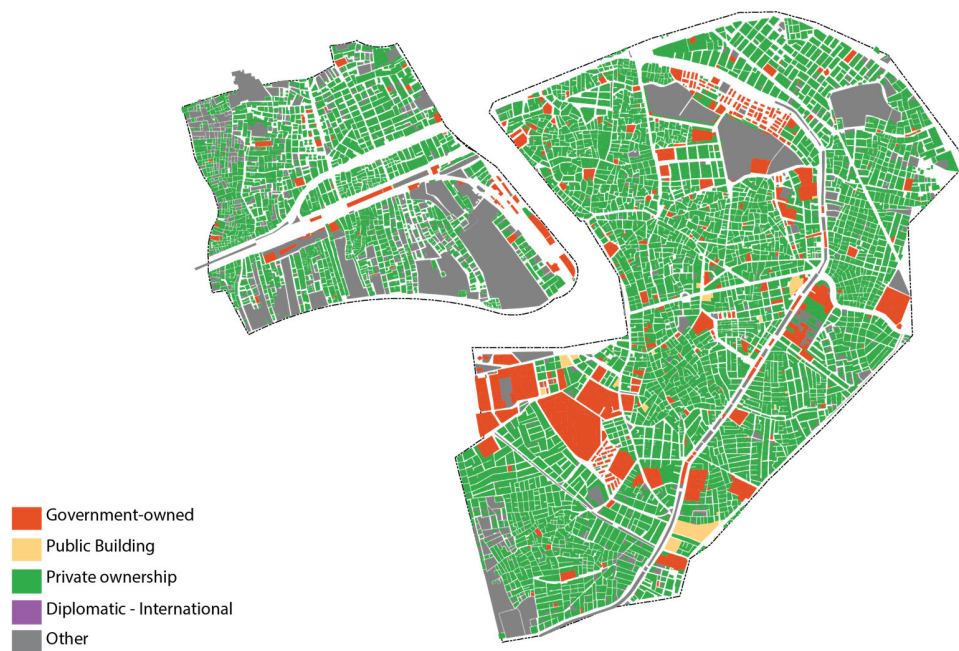
Figure 6-28 – Types of Ownership (Source: *CAPMAS, 2019*, developed by researcher)

6.5. Survey Analysis

The analysis of the survey was divided in sections to address the original variables and tackle the main objectives of the research. This analysis starts with a description of the sample and its constituents, followed by descriptive statistics of questions related to supply chain, social cohesion (trust), norms and networks. Consequently, correlation and regression models have been identified to highlight the significant relationships between variables in this dataset.

This section builds up on the previous qualitative and spatial analysis earlier mentioned in this chapter and sets the base for the following sections examining social capital Network using Network mapping in combination with the results from this survey. This is also the basis of the following spatial mapping (GIS) of the relevant survey questions results to highlight whether the relations identified

have a different spatial dimension that the statistics does not fully cover (such as proximity, transport, infrastructure, etc).

6.5.1. Descriptive Analysis – Dataset Summary

The first layer of interpretation of the survey examines the dataset in terms of frequencies of occurrences of different categories within variables. This gives an indication of the sample divisions, composition and representativeness. Table 6-4 shows the statistical configuration of the sample in terms of age, gender, role in enterprise, level of education and marital status. The results of these independent variables give further detail on the nature of respondents and whether this reflects and represents the community in Damietta or not.

The survey was conducted with a total of 347 respondents. The age of respondents is normally distributed with a range of 19-60 years. The mean age of respondents was mid-40s, with a wide range of ages within the sample. In terms of ranges, the most prevalent ranges are 40s and 50s, followed by 30s (Figure 6-29). This reflects on the diversity in the age at which furniture industry workshop owners start or inherit their businesses in Damietta. Almost all respondents are males, with only 2 females in the sample, which also reflects the statistically accounted for composition of Damietta's furniture industry being a male-dominated business (ILO, 2016). In terms of family structure, most respondents are married, with a small percentage being single, which can also be an indication of the work-live pattern of long-term family business in Damietta's furniture enterprises.

The highest value for respondents' role in enterprise/workshop (Figure 6-30) was sole owners with 57.3%, followed by senior workers (17.6%) and co-owners (12.7%). With 70% of respondents owning and co-owning enterprises, there is a clear indication of the entrepreneurial pattern in Damietta's furniture industry. The notion that most employed respondents refer to being senior skilled workers as compared to employees or junior workers also highlights the significance of

the skillset within the industry, as well as could be taken as an indication of the longevity of time a given worker is employed at an enterprise/workshop. Cross-examining the age and role of respondents (Table 6-5 – Crosstabulation of respondents age range vs role in enterprise (Source: Author results)) shows that the highest captured category is workshop owners aged 40-60 years old.

Table 6-4 -Survey Respondents Frequencies Statistical Analysis (Source: Author results)

		Respondent Age	Respondent gender	Respondent role in enterprise	Level of education	Marital status
N	Valid	344	347	347	341	342
	Missing	3	0	0	6	5
Mean		44.94	1.01	2.25	3.15	1.96
Std. Error of Mean		.534	.004	.092	.084	.018
Median		46.00	1.00	1.00	4.00	2.00
Mode		50	1	1	4	2
Std. Deviation		9.900	.076	1.710	1.558	.332
Variance		98.019	.006	2.924	2.428	.110
Skewness		-.397	13.115	.909	.294	-.164
Std. Error of Skewness		.131	.131	.131	.132	.132
Range		46	1	5	6	3
Minimum		19	1	1	1	1
Maximum		65	2	6	7	4
Sum		15458	349	782	1074	672

Table 6-5 – Crosstabulation of respondents age range vs role in enterprise (Source: Author results)

		Sole Owner	Co-owner	Manager	Employee	Senior Worker	Junior Worker	
Respondent Age Range	-19	0	0	0	0	0	1	1
	20-29	7	2	1	3	9	7	29
	30-39	20	7	0	12	14	2	55
	40-49	76	13	0	8	21	0	118
	50-59	79	15	1	6	14	0	115
	60+	15	6	0	2	3	0	26
Total		197	43	2	31	61	10	344
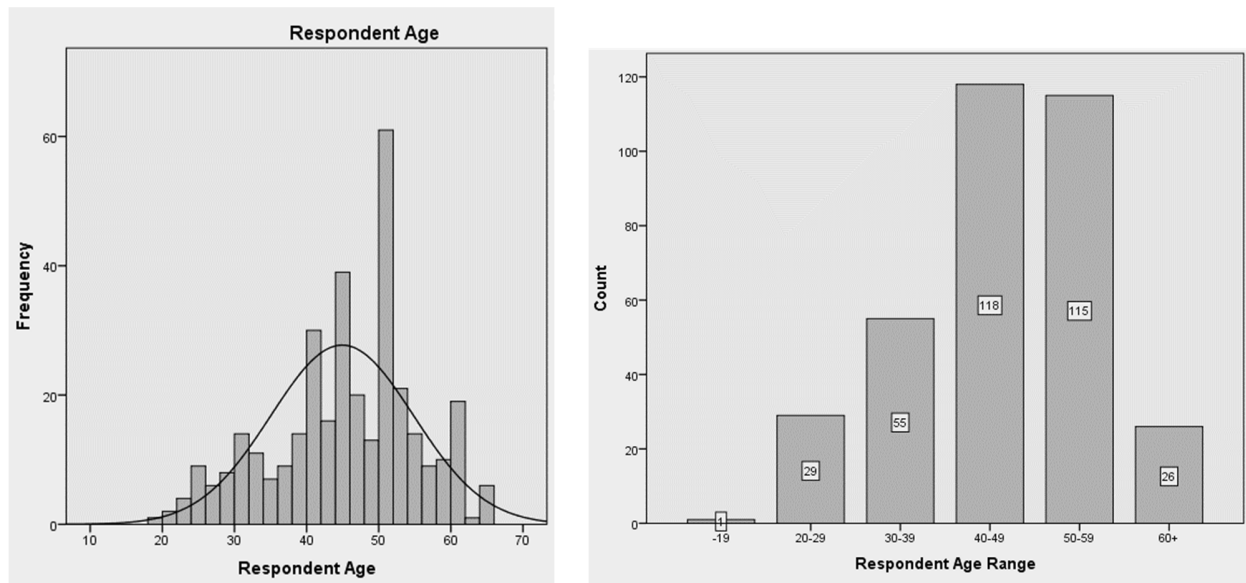
Figure 6-29 –Analysis of Ages of Respondents (Source: Author results)
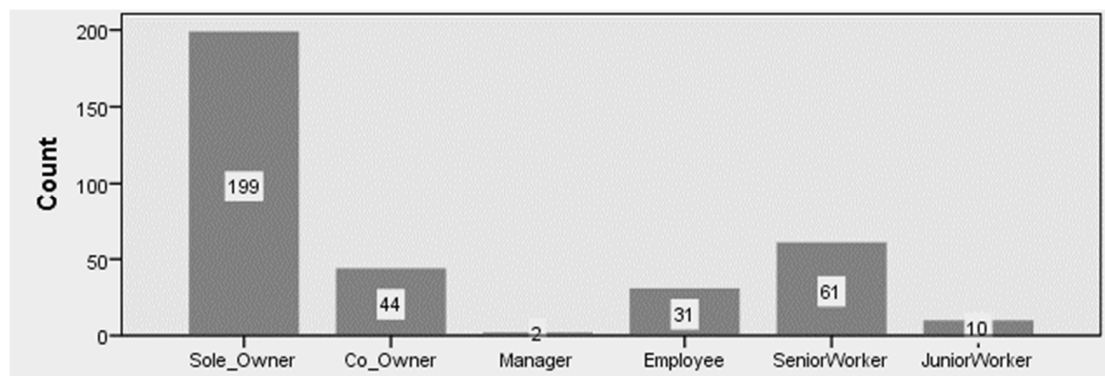
Figure 6-30 –Analysis of Respondents' Role in Enterprise (Source: Author results)

Figure 6-31 - Respondents Marital Status (Source: Author results)

Regarding the education of respondents (Table 6-6 and Figure 6-32), there is a wide range within the sample. The highest percentage is that of industrial secondary education with 37.5%. The second highest category is elementary education (basic education level) at 27.4%. There is also a considerable percentage of uneducated category among participants. Reflecting on analysing the education levels as related to the age ranges of respondents (Table 6-7), most of respondents between 50-59 years old are either uneducated or with basic level of education. The slightly younger age range (40-49 years) exhibit higher education with industrial education and elementary education. For other age ranges, most respondents are in industrial education. This can also be taken as a reflection of the source of skills within the industry in Damietta as passed down tradition rather than a formally learnt set of skills.

Table 6-6 - Level of Education of Respondents (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uneducated	56	16.1	16.4	16.4
	Elementary Education	95	27.4	27.9	44.3
	Secondary Education	17	4.9	5.0	49.3
	Industry Secondary Education	130	37.5	38.1	87.4
	University Degree_ Industry Related	2	.6	.6	88.0
	University Degree _ Unrelated to Furniture Industry	40	11.5	11.7	99.7
	Masters	1	.3	.3	100.0
	Total	341	98.3	100.0	
Missing	999	5	1.4		
	System	1	.3		
	Total	6	1.7		
Total		347	100.0		
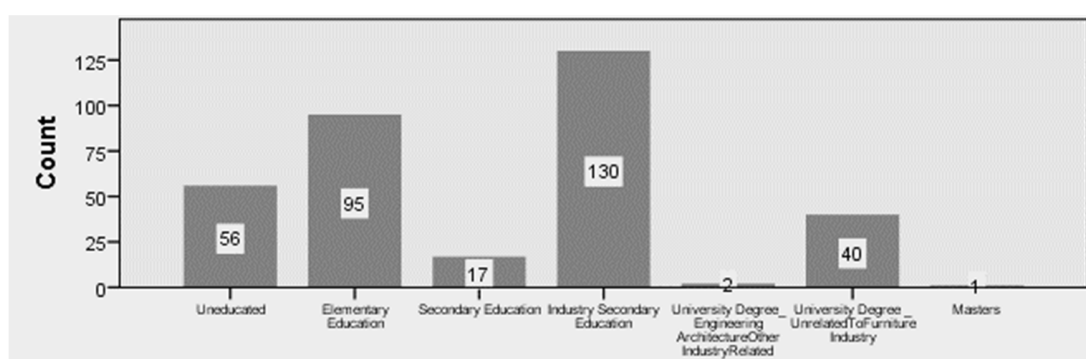
Figure 6-32 - Level of Education of Respondents (Source: Author results)

Table 6-7 - Crosstabulation Analysis between age ranges and level of education
(Source: Author results)

| | | Respondent Age Range | | | | | | |
		-19	20-29	30-39	40-49	50-59	60+	Total
Q12 = Level of education	Uneducated	0	1	3	18	28	5	55
	Elementary Education	0	6	7	33	37	11	94
	Secondary Education	1	1	4	4	5	2	17
	Industry Secondary Education	0	13	31	47	34	5	130
	University Degree_ Engineering Architecture Other Industry Related	0	0	2	0	0	0	2
	University Degree _ Unrelated to Furniture Industry	0	8	7	16	6	2	39
	Masters	0	0	0	0	1	0	1
Total		1	29	54	118	111	25	338

6.5.1.1. Sample Representativeness and Generalisation

In order to verify that the sample can be generalised to the population, a comparative analysis of the number of respondents in each category of work has been conducted for the sample compared to census data (Table 6-8). A higher quota of owners and co-owners was filled in, which corresponds to the original target of the survey being entrepreneurs in the industry in the city. In order to correspond to the percentage of users in the industry, the survey was also filled by a smaller portion of workers to make sure to account for all the perceptions and the hierarchy of power within the social capital network in Damietta.

Another measure to ensure the representativeness of the sample was the original sampling process designed in the methodology in section 4.6.4.1. The sample was designed to address all activities along the furniture industry value change as well as the size of enterprises. As around 97% of enterprises in Damietta are MSMEs, only a few bigger businesses in Damietta were included in the survey responses.

Available information to verify gender representativeness is statistically insufficient to follow through. However, from interviews and existing literature, the furniture industry in Damietta is male dominated with very low presence of women (especially in the target group of this survey which is workshop owners). This is reflected in the sample with only 2 female respondents in the sample compared to 345 males (Table 6-4).

Table 6-8 - Comparing census data of employed persons in furniture enterprises vs survey respondents categories (employment figures from (ILO, 2016) – mentioned in more detail in Table 5-10)

		Combined Census 2013 %				From Survey Sample	
Categories in this research survey	Occupational Categories in 2013 Census data	Public Sector	Private Sector	Public Sector	Private Sector	Number of Respondents	%
Owner/ Co-owner	Employers	-	112,142	0%	42%	240	69.7%
Senior Employee/ Worker	Managers	85	118,480	78%	44%	94	27.3%
	Administrative Workers						
	Supervisors						
	Specialists and technicians						
	Technical works and operators						
Junior Worker	Others	24	39,491	22%	15%	10	3%
Total		109	270,113			344	

6.5.2. Supply chain and Commodities

Literature on Damietta's furniture industry (reviewed in section 5.5) examines the supply chain as a series of activities that theoretically should be carried out sequentially. The empirical primary data collected in this research through in depth interviews (section 6.2) and the work-live pattern analysis based on it (section 6.2.5) provided evidence that the process is in fact not as linear as anticipated to be, and the classification of enterprises on ground is not entirely based on this supply chain of activities. There are different types of enterprises within which a collection of activities coexists. Most respondents did not report one activity, but multiple that correspond to a certain type of product, process or pattern of work.

One of the patterns that prevailed in the responses is that many businesses that identify as carpenters also chose distribution and sales as part of their activities. These enterprises mostly adopt the ***product order pattern*** (Figure 6-12), where the central enterprise/owner is a carpenter who gets an order/transaction that they outsource to neighbouring enterprises to finish different parts of the work. The work is then collated at the end within the central carpenter's workshop to be delivered to the client.

From this notion, examining the percentage of activities declared by respondents (Table 6-9) shows the highest percentage being distribution and sales rather than carpentry, which is because many businesses do a certain activity while also taking on sales, while fewer enterprises only do a given commodity such as veneering, upholstery, etc. Similarly, marketing and packaging are activities that take place within an enterprise that has another base of work – usually either carpentry or distribution.

Contrary to expectations from this survey, the number of enterprises declaring carpentry as their activities is average among the supply chain, with similar percentage to transport for example. This is also an indication that the most prevalent pattern of work is not enterprise sequential, but product order.

Some activities were almost non-existent in the responses, which presents the possible gaps in the process. After sales support was one of such activities with very low percentile. Equally, Inbound logistics, design, assembly and value-added services showed low figures. This represents, on one side, a gap in the logistic process within Damietta, which is a reflection of the degree of informality and small scale of the industry in the city. On another side, it is also a reflection that these activities either take place as part of another activity (such as design or assembly), or are discarded from the process as a whole (such as value-added services and also design in some cases). Results from the interviews corroborate this perspective as issues related to "authenticity of design" and

quality management present an area of conflict within the trade, especially with the use of hand-crafting vs CNC technology in generating and executing the designs.

Table 6-9 - Number of declared activities by respondents (check all that applies question) (Source: Author results)

		Responses		Percent of Cases
		N	Percent	
Enterprise Activity [a]	Design	20	3.0%	5.8%
	Purchasing	65	9.7%	18.7%
	Inbound logistics	17	2.5%	4.9%
	Cutting and Carpentry	45	6.7%	13.0%
	Carving	28	4.2%	8.1%
	Veneering	24	3.6%	6.9%
	Finishing (staining, polishing etc.)	29	4.3%	8.4%
	Upholstery	25	3.7%	7.2%
	Assembly	17	2.5%	4.9%
	Testing	54	8.1%	15.6%
	Value added services	21	3.1%	6.1%
	Packaging	70	10.5%	20.2%
	Marketing	68	10.2%	19.6%
	Distribution & Sales (wholesalers, retailers, contract buyers and showrooms).	130	19.5%	37.5%
	Transportation	37	5.5%	10.7%
	After sales support	13	1.9%	3.7%
	Other supplementary Works	5	0.7%	1.4%
	Total	668	100.0%	192.5%

a. Dichotomy group tabulated at value 1.
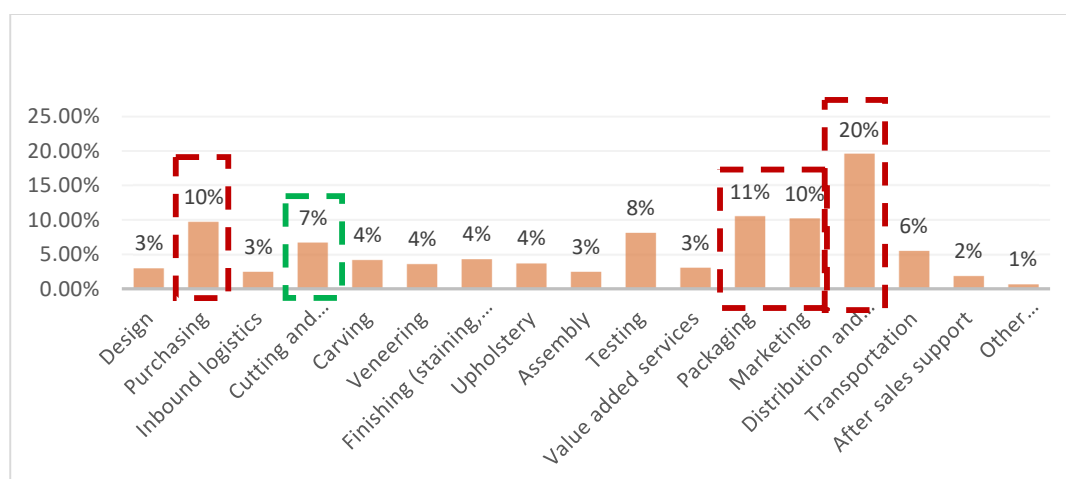
Figure 6-33 - Percentage enterprise activities declared by respondents in survey (Source: Author results)

6.5.3. Social Cohesion (Trust & Reciprocity)

As per Appendix 6 on the survey design questions as related to the research themes, questions related to Social Cohesion are 15 (a,b), 16, 18 (a,b,c), 19 (b,d) and 21 (a,b,c,d). These questions relate to the amount of time respondents lived and family generations in Damietta (testing long-term relationships), whether the community believes in the presence of mutual trust between members of the industry (reciprocity), and whether this trust is translated into support in business transactions in their business (trust as a currency/value of trust in business).

Table 6-11 below shows the statistical frequencies of Social Cohesion questions in the survey. Analysis in this section is based on respondents' answers only, which is the sample of 347 respondents. These questions were not addressed by the respondents' network connections and are a measure of personal rather than collective social capital for this case study. There is another scale of the sample, which is the complete network of contacts (respondents and contacts) used in the network analysis in following sections. One question has been introduced on trust in this sample with 996 nodes and 716 directed ties (more information in section 6.5.5). This is to have an understanding of trust as perceived by respondents as well as being a type of tie between nodes of the network.

The following tables (Table 6-12 to Table 6-23) examine the answers in further detail. From the results presented in these tables, findings on the degree and nature of trust and reciprocal transactions between enterprises in Damietta can be deduced.

Questions 15a, 15b and 16 examine the length of time respondents lived in Damietta. Findings show that almost all respondents were born and raised in the city – more than 93% (Table 6-13). Results also show that less than 2% of respondents spent less than 10 years of their lives in the city (Table 6-12), which

indicates that even if they were not born and raised in Damietta, 98% of respondents lived more than 10 years in the city. Beyond a single generation, question 16 investigates whether families owning enterprises in Damietta lived in the city for longer than the lifetime of a single generation. Results for this question show that around 90% of respondents have been in Damietta for more that 2 generations. This clearly indicates that the families of these respondents either has owned this enterprise for more than one generation, own more than one enterprise in the city as the generations progressed, or both.

Questions 18 (a,b,c) and 19 (b,d) examine the trust and reciprocity of this trust within the furniture industry community in Damietta in general. In questions 18a and 18c, the survey examines the difference between friendliness and trust in business, with friendliness extending to clients and other stakeholders, while trust is strictly related to business. In both measures, around 85% of respondents answered positively, which is an indication that the community in Damietta generally perceives a very high degree of trust between members of the industry. That said, this trust develops conditional to previous transactions in business or previous friendship/kinship to build this trust. This is particularly evident in the responses for question 19b, where respondents were asked if they trust others who they have not met or worked with before. Unlike all previous questions in this section, the answers for 19b were mostly negative (68%).

Tackling the notion of reciprocal trust being translated into positive action (social capital) in business, the rest of the questions in this section (19d and 21 a,b,c,d) address this from different angles. In 19d, 79% of respondents declared they have trust in their contacts providing support to them when/if needed within the industry. Combining this with information from interviews conducted in this research, this notion is built on previous experience with these contacts, and cumulatively builds up with more transactions and higher reciprocity in the time of need in business.

Regarding reciprocity in offering materials or labour force in times of need, Q21 a, & b investigate both directions of such reciprocity between contacts. Even though most respondents declared they can count on their contacts' support when needed (question 19d), the highest percentage voted for being selective of who to ask for support from when needed and similarly who they would lend materials or labour force if needed (questions 21 a,b). They would neither lend support nor ask it from just anyone in the business, but rather select whom they would allow this sort of reciprocal transactions away from normal market selling/buying. A considerably high percentage also indicated they would not ask for such support or provide it in general. This gives an insight on the priorities and competitive nature within the industry that surpasses even this prevalent case of trust within the community.

Another aspect in reciprocal transactions is recommending other businesses to clients or to enterprises looking for collaborative work (typical in product order-based pattern in the furniture industry - Figure 6-12 B). This was explored in Q21c and Q21d, where respondents were asked whether they would recommend other businesses, specifically if they have worked with them before or they have not respectively. In Q21c with the respondents recommending enterprises they already know; the answers were highly positive with 89% approving of recommending their contacts. In the case where respondents do not have prior knowledge of the enterprises they are recommending (Q21d), the answers were split almost down the middle between supporters of this recommendation, and the other half who would not recommend enterprises/contacts they do not know.

Regarding the different preferences in recommendations, other factors come to play in this dynamic, where it might be helpful to refer to the interviews results. One of these factors is the type of activity of the recommended vs the recommender. If the recommender is passing information on an enterprise working in a different activity on the supply chain, they would be more at ease to

recommend others without feeling any threat to their own business. They might be cautious to recommend enterprises they have worked before as this might affect the quality of the work they are involved in for some cases. If both recommender and recommended work in the same activity, this would happen primarily if the recommender is either extremely saturated with amount of work they have in their own business, and do not mind passing extra work to others.

The one question that extrapolates the social cohesion analysis on the larger network scale (a sample of 716 ties) asks how well does the respondent "trust" their named contact (Q32a - Table 6-10). Examining this on the scale of the wider mapped network gives a holistic measure of the prioritisation of trust compared to simple non-cumulative business interactions. 95% of the directed ties in the network declared they trust their contacts, with 69% stating the highest level of trust on the given Likert scale. This indicates a very high representation of trust in the network and reiterates on the result from the smaller scale sample analysis above.

Table 6-10 – Q32a – "I trust this contact" (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	484	67.6	68.9	68.9
	To an extent	181	25.3	25.8	94.7
	I don't think so	23	3.2	3.3	98.0
	False	14	2.0	2.0	100.0
	Total	702	98.0	100.0	
Missing	999	14	2.0		
Total		716	100.0		

Table 6-11 - Frequencies - Trust and Reciprocity Survey Responses (Source: Author results)

Questions*		Q15a	Q15b	Q16	Q18a	Q18b	Q18c	Q19b	Q19d	Q21a	Q21b	Q21c	Q21d
N	Valid	346	342	342	343	342	342	342	342	343	343	343	343
	Missing	1	5	5	4	5	5	5	5	4	4	4	4
Mean		3.23	.93	3.77	1.61	2.04	1.66	2.92	1.89	3.14	3.15	1.44	2.56
Median		3.00	1.00	4.00	1.00	2.00	1.00	3.00	2.00	3.00	3.00	1.00	3.00
Mode		3	1	4	1	2	1	4	2	3	3	1	4
Std. Deviation		.719	.251	.715	.837	.956	.878	.993	.910	.840	.843	.873	1.236
Variance		.517	.063	.511	.701	.913	.770	.987	.828	.706	.710	.762	1.527
Skewness		-.554	-3.471	-3.027	1.237	.567	1.242	-.479	.844	-.954	-1.036	2.016	-.056
Std. Error of Skewness		.131	.132	.132	.132	.132	.132	.132	.132	.132	.132	.132	.132
Range		3	1	3	3	3	3	3	3	3	3	3	3
Minimum		1	0	1	1	1	1	1	1	1	1	1	1
Maximum		4	1	4	4	4	4	4	4	4	4	4	4

* Questions text:
Q15a =   Number of years lived in Damietta
Q15b =   Born and Raised in Damietta?
Q16 =   Family generations in Damietta
Q18a =   Would you say that people working in furniture industry in Damietta are friendly?
Q18b =   Would you say that Damietta's furniture industry community looks after one another?
Q18c =   Would you say that people working in furniture industry in Damietta trust one another?
Q19b =   I have an inherent sense of trust in others in the furniture industry, even if I never met them before?
Q19d =   I can trust in my contacts/colleagues' help and support if I need it.
Q21a =   How comfortable are you to: ask other business owners for materials/supporting workers when you have a sudden load of work?
Q21b =   How comfortable are you to: Lend other business owners' materials/supporting workers when they ask due to a sudden load of work?
Q21c =   How comfortable are you to: Recommend another enterprise that you've previously worked with to a client?
Q21d =   How comfortable are you to: Recommend another enterprise that you never previously worked with to a client?

Table 6-12 – Q15a - Years Lived in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-9	4	1.2	1.2	1.2
	10-29	47	13.5	13.6	14.7
	30-49	162	46.7	46.8	61.6
	50-	133	38.3	38.4	100.0
	Total	346	99.7	100.0	
Missing	System	1	.3		
Total		347	100.0		

Table 6-13 –Q15b – Born and Raised in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	23	6.6	6.7	6.7
	yes	319	91.9	93.3	100.0
	Total	342	98.6	100.0	
Missing	999	4	1.2		
	System	1	.3		
	Total	5	1.4		
Total		347	100.0		

Table 6-14 –Q16 – Family generations in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	13	3.7	3.8	3.8
	Yes1	18	5.2	5.3	9.1
	Yes2	3	.9	.9	9.9
	MoreThan2	308	88.8	90.1	100.0
	Total	342	98.6	100.0	
Missing	999	4	1.2		
	System	1	.3		
	Total	5	1.4		
Total		347	100.0		

Table 6-15 –Q18a – Friendliness of furniture industry community (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely	201	57.9	58.6	58.6
	To an extent	89	25.6	25.9	84.5
	I don't think so	40	11.5	11.7	96.2
	No	13	3.7	3.8	100.0
	Total	343	98.8	100.0	
Missing	999	1	.3		
	System	3	.9		
	Total	4	1.2		
Total		347	100.0		

Table 6-16 –Q18b – Reciprocity in trust translated into positive action in furniture industry community (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely	117	33.7	34.2	34.2
	To an extent	126	36.3	36.8	71.1
	I don't think so	67	19.3	19.6	90.6
	No	32	9.2	9.4	100.0
	Total	342	98.6	100.0	
Missing	999	2	.6		
	System	3	.9		
	Total	5	1.4		
Total		347	100.0		

Table 6-17 –Q18c – Trust between furniture industry community in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely	189	54.5	55.3	55.3
	To an extent	100	28.8	29.2	84.5
	I don't think so	33	9.5	9.6	94.2
	No	20	5.8	5.8	100.0
	Total	342	98.6	100.0	
Missing	999	2	.6		
	System	3	.9		
	Total	5	1.4		
Total		347	100.0		

Table 6-18 – Q19b – Trust in contacts vs in community (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	36	10.4	10.5	10.5
	To an extent	76	21.9	22.2	32.7
	I don't think so	111	32.0	32.5	65.2
	False	119	34.3	34.8	100.0
	Total	342	98.6	100.0	
Missing	Total	5	1.4		
	Total	347	100.0		

Table 6-19 – Q19d – Trust in getting support from contacts in the community if needed (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	134	38.6	39.2	39.2
	To an extent	137	39.5	40.1	79.2
	I don't think so	44	12.7	12.9	92.1
	False	27	7.8	7.9	100.0
	Total	342	98.6	100.0	
Missing	Total	5	1.4		
	Total	347	100.0		

Table 6-20 – Q21a – Asking for materials or workers from others (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do this All the time	23	6.6	6.7	6.7
	When necessary anyone I know	31	8.9	9.0	15.7
	When necessary only Selective People	164	47.3	47.8	63.6
	I never do this	125	36.0	36.4	100.0
	Total	343	98.8	100.0	
Missing	Total	4	1.2		
	Total	347	100.0		

Table 6-21 – Q21b – Lending others materials or workers (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do this All the time	25	7.2	7.3	7.3
	When necessary anyone I know	24	6.9	7.0	14.3
	When necessary only Selective People	167	48.1	48.7	63.0
	I never do this	127	36.6	37.0	100.0
	Total	343	98.8	100.0	
Missing	Total	4	1.2		
	Total	347	100.0		

Table 6-22 – Q21c – Recommending other businesses to clients (existing contacts) (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do this All the time	255	73.5	74.3	74.3
	When necessary anyone I know	50	14.4	14.6	88.9
	When necessary only Selective People	13	3.7	3.8	92.7
	I never do this	25	7.2	7.3	100.0
	Total	343	98.8	100.0	
Missing	Total	4	1.2		
	Total	347	100.0		

Table 6-23 – Q21d – Recommending other businesses to clients (new contacts) (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do this All the time	100	28.8	29.2	29.2
	When necessary anyone I know	69	19.9	20.1	49.3
	When necessary only Selective People	55	15.9	16.0	65.3
	I never do this	119	34.3	34.7	100.0
	Total	343	98.8	100.0	
Missing	Total	4	1.2		
	Total	347	347	100.0	

6.5.4. Norms

As per Appendix 5, investigation of the dynamics of Norms within the furniture industry society in Damietta was done through questions 19 (a,c), 22, 23, 24 and 25. These questions relate to the respondents' perception of the community of furniture industry in Damietta, particularly related to the way they view collective norms and ideologies such as sense of belonging, belief in collegiality and need for a collective effort towards bettering the industry in the city. Table 6-25 shows the statistical frequencies of Norms- related questions in the survey. Similar to the previous section, analysis here is based on respondents' answers only, which is the sample of 347 respondents. These questions were not addressed by the respondents' network connections and are a measure of the personal perception of respondents on norms for this case study.

Questions 19a and 19c explore the perception of respondents on their own sense of belonging and pride in being associated with the furniture industry in Damietta as an individual. For both questions, the answers were positive (62% and 64% respectively). This confirms the sense of ownership and collective entrepreneurial nature of the industry in Damietta as hypothesised in the early stages of this research.

Another significant aspect regarding norms and common beliefs is the existence of supporting bodies/organisations/cooperatives that strengthen the existing connections within the community and enforces the community norms (or introduces new norms and traditions). From interviews, Chamber of Woodworking and Furniture Industry (CWWFI) in Damietta was mentioned as the most renowned formal organisation that related to the furniture industry in the city and aims to connect the industry society providing opportunities for development. Questions 22 and 23 target identifying the efficacy of connection between CWWFI and individuals in the industry. In Q22 (Table 6-28), respondents are asked about the level of engagement they have with CWWFI. 90% of respondents declared they have no contact with the organisation through

business, training or any other activities. This is an indication that social capital has been sustained on a community level with a rather vernacular pattern of evolution with little influence from external organisations. It is worth mentioning that respondents stating they have direct contact with CWWFI through business and events were a total of less than 2%.

Through cross-tabulating Q22 with respondent role in the enterprise (Table 6-24), it is clear that firstly the 90% results declaring no contact with CWWFI are distributed among the different roles, which reflects that the lack of contact with CWWFI is not just within workers category for instance, but even owners don't have any contact with the organisations. The second observation from this analysis reveals that the 3.5% of respondents stating they did not have prior knowledge of the existence of the CWWFI (Table 6-28) are also distributed on the different roles. Unlike this pattern, respondents stating they follow WDF though others (4.7%) are mostly responses by owners and co-owners of enterprises.

Table 6-24 - Crosstabulation of contact with CWWFI and role of respondent in their enterprise (Source: Author results)

| | | Q11 = Respondent role in enterprise | | | | | | |
		Sole Owner	Co-Owner	Manager	Employee	Senior Worker	Junior Worker	Total
Q22 = Do you have contact with Woodwork Furniture Chamber?	Constant Contact through business	4	0	0	0	0	0	4
	Attend Events and Follow Updates	1	0	0	0	0	0	1
	Follow Through others	9	3	1	3	0	0	16
	No Contact	180	40	1	26	58	6	311
	I didn't Know CWWFI Exists	3	1	0	2	2	4	12
Total		197	44	2	31	60	10	344

For Q23 (Table 6-29), the question was related to the role of CWWFI in formulating the collective identity in the furniture industry in Damietta. The responses were 97% declining to CWWFI having any input role. This also corroborates the results from Q22 highlighted above.

The last two questions in this section address respondents' perception of how the sense of belonging between the furniture industry society evolved in the recent years (Q25), and what they believe it should be in the future (Q24). 96% of respondents answered Q25 that the sense of belonging has "gotten worse" over the past 5 years (Table 6-31), which is in line with the data from interviews on the community view that the community was much more connected than currently with regard to the furniture industry. In Table 6-30 for Q24, when asked whether they believe enterprises should work together towards common growth of the industry in Damietta (work collectively to strengthen the social capital network), respondents were skewed towards agreeing with the notion (with almost 60/40 division between agreeing and disagreeing opinions). It is also interesting that around 40% of respondents disagreed with the notion, which given insight on the individuality within the business development aspirations rather than as aspiring for a collective development of the city.

Looking into the questions for this section collectively, it can be concluded that there is a high sense of collegiality and belonging within the furniture industry in Damietta, which has evolved in the recent year to become to an extent conditional to individual benefit to the person/enterprise. It is important to reiterate that the network from the angle of norms is evolving vernacularly according to multiple factors that boost or decrease the overall sense of belonging and sense of community in an organic manner. Factors that positively affect norms include the accumulated social capital over decades in the city and the existing trust between individuals, as well as the individual business benefit that individual enterprises gain from having a stronger industrial node in the city. There are also factors negatively affecting the societal norms which is the market pressures that pushes users to deprioritise the collective good as compared to keeping their business afloat, which was also a theme discussed in the interviews. There are missing opportunities of positive influence by existing and/or new organisations to support higher collective goals within Damietta.

Table 6-25 - Frequencies - Trust and Reciprocity Survey Responses (Source: Author results)

		Q19a	Q19c	Q22	Q23	Q24	Q25
N	Valid	342	342	344	343	342	344
	Missing	5	5	3	4	5	3
Mean		2.09	1.85	3.95	3.69	2.30	1.99
Median		2.00	1.00	4.00	4.00	2.00	2.00
Mode		1	1	4	4	1	2
Std. Deviation		1.044	1.092	.442	.541	1.223	.202
Variance		1.089	1.193	.196	.292	1.496	.041
Skewness		.384	.932	-3.712	-1.727	.289	-.625
Std. Error of Skewness		.132	.132	.131	.132	.132	.131
Range		3	3	4	3	3	2
Minimum		1	1	1	1	1	1
Maximum		4	4	5	4	4	3

* Questions text:
Q19a =   I feel a special sense of belonging with others in the furniture industry in Damietta?
Q19c =   I am proud to be part of the furniture industry profession in Damietta.
Q22 =   Do you have contact with Woodwork Furniture Chamber?
Q23 =   CWWFI encourages collective identity in Furniture sector in Damietta.
Q24 =   Furniture enterprises must work together for common interest and growth.
Q25 =   Do you think over the past 5 years, the sense of belonging to the furniture sector in Damietta has gotten better, worse, or stayed about the same?

Table 6-26 – Q19a – Feeling of belonging in the furniture industry in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	136	39.2	39.8	39.8
	To an extent	76	21.9	22.2	62.0
	I don't think so	94	27.1	27.5	89.5
	False	36	10.4	10.5	100.0
	Total	342	98.6	100.0	
Missing	Total	5	1.4		
	Total	347	100.0		

Table 6-27 –Q19c – Feeling pride in being part of the furniture industry in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	185	53.3	54.1	54.1
	To an extent	69	19.9	20.2	74.3
	I don't think so	41	11.8	12.0	86.3
	False	47	13.5	13.7	100.0
	Total	342	98.6	100.0	
Missing	Total	5	1.4		
	Total	347	100.0		

Table 6-28 –Q22 – Contact with Chamber of Woodworking and Furniture Industry (CWWFI) in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Constant Contact through business	4	1.2	1.2	1.2
	Attend Events and Follow Updates	1	.3	.3	1.5
	Follow Through others	16	4.6	4.7	6.1
	No Contact	311	89.6	90.4	96.5
	I didn't Know CWWFI Exists	12	3.5	3.5	100.0
	Total	344	99.1	100.0	
Missing	Total	3	.9		
	Total	347	100.0		

Table 6-29 –Q23 – CWWFI's contribution to collective identity in the sector in Damietta (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely	2	.6	.6	.6
	To an extent	7	2.0	2.0	2.6
	I don't think so	88	25.4	25.7	28.3
	False	246	70.9	71.7	100.0
	Total	343	98.8	100.0	
Missing	999	1	.3		
	System	3	.9		
	Total	4	1.2		
	Total	347	100.0		

Table 6-30 –Q24 – Belief in enterprises working together towards common interest/growth (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely Agree	128	36.9	37.4	37.4
	Somewhat Agree	74	21.3	21.6	59.1
	I don't think so	49	14.1	14.3	73.4
	Definitely disagree	91	26.2	26.6	100.0
	Total	342	98.6	100.0	
Missing	Total	5	1.4		
	Total	347	100.0		

Table 6-31 –Q25 – View of how sense of belonging evolved in the industry in Damietta in the past 5 years (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Gotten Better	8	2.3	2.3	2.3
	Gotten Worse	330	95.1	95.9	98.3
	Stayed about the same	6	1.7	1.7	100.0
	Total	344	99.1	100.0	
Missing	Total	3	.9		
	Total	347	100.0		

6.5.5. Networks

The analysis of networks in this research is quite extensive compared with that of social cohesion and norms. In this section, part of this analysis is conducted, which involves a descriptive account of the survey questions regarding networks as per Appendix 5. These questions are divided into the previously identified literature themes; embedded resources, contact statuses and network locations (Coleman, 1988; Hunt et al., 2015b; Koivumäki, 2013; Lin, 1999; Putnam, 1995, 2002; Putnam et al., 1993). The questions for each theme are identified in Table 6-32 below.

In previous survey analysis sections, the sample was only respondents of this survey. To grasp to full extent of the connections in the networks section of the survey, the sample here is all respondents and the contacts they declared. This full network is the base of this analysis here, as well as the following social capital network analysis mapping in section 6.6. Within this dataset, respondents and contacts are all referred to as a unit "node", where in the following mapping analysis the relation between each two nodes is a "tie" (further explanation in section 6.6 below). The total number of nodes in this network dataset is 996 nodes with 716 directed ties. The ties form the sample used in this section of the analysis. There are some overlaps between the questions used to calculate the three themes, which is related to the definition of each theme and the relevance of the question within these definitions.

Table 6-32 – Survey questions for network analysis (Source: survey design by Author)

Networks	Embedded Resources	Q36, Q33, Q34, Q32b
	Contact Statuses	Q31, Q32b
	Network Locations	Q34, Q32b, Q36

Questions related to embedded resources measure the extent/strength of the tie in terms of frequency of working together or having further connection beyond

business transaction (such as meeting frequently), which would also reflect on a stronger social capital to be utilised in business. This includes questions on the frequency of meeting (Q34) and working with (Q33) the named contact, as well as the scope (Q36) and reach/pull this contact has in the market in the industry (Q32b). Together, these results indicate the strength of this contact as a "resource" for the person who named them (Coleman, 1990).

The second measure being contact status is related to the status of the contact in the market (Coleman, 1990), which would also provide a different level of strength of this contact. This is measured through understanding the power this contact has within their organisation reflected in their role in the enterprise (Q31) and the amount of leverage they have in the market (Q32b).

The third and last measure in this category is network locations, which involves understanding how the contact is situated strategically in the network, as well as their physical location plays a role in strengthening the social capital (especially in a spatial case study like Damietta) (Coleman, 1990). The strategic allocation of the contact within the network is measured with Q32b, where the more leverage they have in the market, the more well-situated they are and the stronger of a contact they are. The effect of proximity and physical location is measured through Q34 and Q36 on the frequency of meeting one another and the scope of work (local vs regional) respectively. These questions together would provide a clearer view on how strong this specific link is given the physical and network-related placement.

Statistically examining the results from the survey questions (Table 6-34 to Table 6-38), there are high indications of positive prevalence of all three measures of networks stated above. This is further investigated in the following section 6.5.6 where calculated values for social cohesion, norms and network measures are presented based on combined figures for survey questions results.

For the role of contact in each enterprise (Q31), more than 96% of nodes in the network are owners and co-owners of their enterprises, which indicates that the scale of connections between nodes is on an entrepreneurial level to secure business interactions. This also related to the scale of enterprises in Damietta being MSMEs, which would suggest more people own their workshops with a few or no workers/employees. Reflecting on network hierarchy (Gittell and Vidal, 1998,Hunt et al., 2015,Szreter, 2002,Szreter and Woolcock, 2004), this indicates that most ties are bonds (connections on the same level/similar background in the industry) rather than links or bridges.

Regarding the power in the market (Q32b), the results in here are divided almost equally on different categories, except for the extreme lack of power in the field on the Likert scale (logically to be expected). This highlights that power is distributed among the industry community in Damietta in a homogeneous manner. This is uniquely unlike the central/capitalist economic model that can be viewed in other industries in different contexts, where power would be concentrated with certain enterprises while the majority of enterprises have relatively low influence in the market. This is a clear reflection of how this vernacular accumulative economic clustering with traditional norms and long-term patterns has helped formulate a parallel model that provides a more equally distributed scale of power in business.

Q33 examines the frequency by which nodes work together within the network. More than 80% of business ties take place on a weekly and few times a week basis, which is quite frequent considering that these are separate enterprises in the industry, suggesting a lot of business interactions between these enterprises. The distribution of the majority of ties are within a timeframe that ranges from a monthly basis to a few times a week. This is also a closely-knit timeframe for business interactions (Coleman, 1990). Similarly, for Q34 (frequency of meeting the contact without business interactions), 84% stated they meet their contacts weekly and a few times a week, while most other are in a similar range to the

Q33. It is interesting that only around 3% of ties for both questions stated monthly or less.

Looking into the scope of work of the enterprise and whether they work locally in Damietta, regionally only or on both scopes (Q36), almost half the results indicated local enterprises, while the other half indicated local and regional involvement in business. Very few entries indicate an enterprise works only outside Damietta. This reflects the focus of the industry community on the local scale, and reiterates on the fact that Damietta is a prime hub for furniture industry where clients are more likely to visit specifically for the sake of buying furniture. Having half of the community working outside Damietta is a rather unexpected figure. The researcher hypothesises that in further research investigating national versus international scope of work, this figure would show more national business interactions than exports.

Table 6-33 - Frequencies - Network Survey Responses – Collective social capital (Source: Author results)

		Q31	Q32b	Q33	Q34	Q36
N	Valid	704	702	702	702	
	Missing	12	14	14	14	
Mean		1.14	1.97	3.00	2.77	2.10
Median		1.00	2.00	3.00	3.00	3.00
Mode		1	1	3	3	3
Std. Deviation		.627	.846	.696	.912	.992
Skewness		5.297	.210	.029	.004	-.204
Std. Error of Skewness		.092	.092	.092	.092	.092
Range		5	3	4	4	2
Minimum		1	1	1	1	1
Maximum		6	4	5	5	3

* Questions text:
Q31 =   Target: Respondent role in enterprise
Q32b =   This contact has a lot of pull in the market
Q33 =   How frequently do you work with this contact?
Q34 =   How frequently do you meet this contact?
Q36 =   This contact works mostly from outside Damietta

Table 6-34 – Q31 – Network nodes role in enterprises (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sole Owner	655	91.5	93.0	93.0
	Co-Owner	26	3.6	3.7	96.7
	Manager	4	.6	.6	97.3
	Employee	13	1.8	1.8	99.1
	Senior Worker	2	.3	.3	99.4
	Junior Worker	4	.6	.6	100.0
	Total	704	98.3	100.0	
Missing	System	12	1.7		
	Total	716	100.0		

Table 6-35 –Q32b – Network nodes power in the market (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely true	250	34.9	35.6	35.6
	To an extent	233	32.5	33.2	68.8
	I don't think so	208	29.1	29.6	98.4
	False	11	1.5	1.6	100.0
	Total	702	98.0	100.0	
Missing	999	14	2.0		
	Total	716	100.0		

Table 6-36 –Q33 – Frequency of work between network nodes (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Everyday	19	2.7	2.7	2.7
	A Few Times A week	94	13.1	13.4	16.1
	Once A Week	479	66.9	68.2	84.3
	A Few Times A Month	90	12.6	12.8	97.2
	Once A Month Or Less	20	2.8	2.8	100.0
	Total	702	98.0	100.0	
Missing	999	14	2.0		
	Total	716	100.0		

Table 6-37 –Q34 – Frequency of contact/meetups between network nodes (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Everyday	68	9.5	9.7	9.7
	A Few Times A week	163	22.8	23.2	32.9
	Once A Week	362	50.6	51.6	84.5
	A Few Times A Month	83	11.6	11.8	96.3
	Once A Month Or Less	26	3.6	3.7	100.0
	Total	702	98.0	100.0	
Missing	999	14	2.0		
	Total	716	100.0		

Table 6-38 –Q36 – Network nodes scope of work (Source: Author results)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inside Damietta	313	43.7	44.6	44.6
	Outside Damietta	5	.7	.7	45.3
	Both	384	53.6	54.7	100.0
	Total	702	98.0	100.0	
Missing	999	14	2.0		
	Total	716	100.0		

6.5.6. Social Capital Relative Scores

In the previous three sections 6.5.3, 6.5.4 and 6.5.5, an understanding of the results of separate questions were indicators of the patterns of social capital that are prevalent in the industry in Damietta. In this section of analysis, quantitative measures have been calculated for social cohesion, networks and norms based on the collective results from the survey. Questions used in calculating these values are stated in Table 6-39 below, followed by the calculated values (Table 6-40) and synthesis of what these indicate.

Table 6-39 – Questions used in social capital measures calculations (Source: survey design by author)

Dependent Variable		Question in survey
Social Cohesion **(Trust and Reciprocity)**		Q15 a,b , Q16, Q18, Q19b Q19d, Q21 a-d
Networks	Embedded Resources	Q36, Q33, Q34, Q32b, Q35, Q37
	Contact Statuses	Q31, Q32b
	Network Locations	Q34, Q32b, Q35, Q36
Norms		Q19 a,c, Q22, Q23, Q24, Q25

Table 6-40 – Calculated social capital measures according to survey results
(Source: Calculated from author results)

		Calculated Trust Score	Calculated Norms score	Calculated Total Network score	Networks Themes		
					Calculated Embedded Resources score	Calculated Contact Status score	Calculated Network Locations score
N	336	339		702	702	702	702
	11	8		14	14	14	14
Mean*		6.6443	4.9846	6.2553	5.2637	7.9076	5.5945
Median*		6.6667	5.1389	5.9251	5.4142	7.5000	5.5556
Mode*		6.88	5.83	7.41	6.66	10.00	5.56
Std. Deviation		1.08638	1.18675	1.05511	1.30583	1.65126	1.38696
Skewness		.010	-.096	.314	.043	-.209	.256
Std. Error of Skewness		.133	.132	.092	.092	.092	.092
Range		6.53	5.08	5.78	5.54	7.92	7.11
Minimum		3.47	2.83	3.67	2.79	2.08	2.89
Maximum		10.00	7.92	9.44	8.33	10.00	10.00

Range: 1: least value for social capital.
10: highest value for social capital.

Table 6-40 exhibits calculation of relative values of social capital dimensions from literature as perceived by the community in Damietta through the survey executed for furniture industry MSMEs. One of the significant indicators here is that almost all mean values are towards to higher end of the scale, indicating a positive abundence of social capital in the sample. The only indicator that was below medium mean value is the norms, and even in this case, the mode (the most abundant value in the dataset) value is still above average towards higher social capital.

It is also worth stating that the data for most measures is positively skewed, indicating higher social capital values. This is apparent through observing the normal distribution of the calculated measures (Figure 6-34,Figure 6-35 and Figure 6-36).

These relative values reiterate the previously identified results in a collective manner, where measures of trust, reciprocity and networking for the whole dataset indicate prevalent social capital. The lower value for norms can be analysed as a reflection of the vernacularity of the evolution of social capital as a collective value in the community. The lack of driving/supporting bodies that push forward and stir the market into capitalising on the existing social capital might justify the values arising, and propose a gap in the structure of the market and industry society in the city with a lot of room for development and further research.
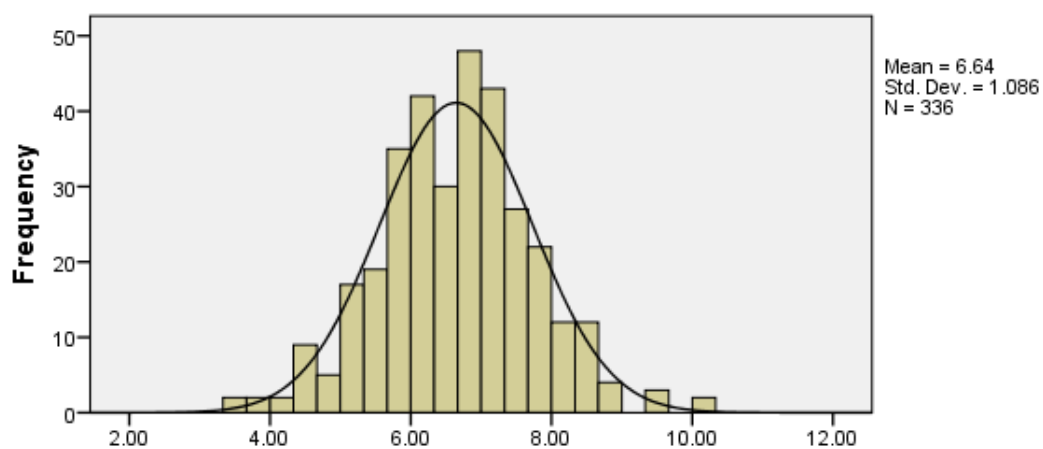
Figure 6-34 - Calculated social cohesion relative score (Source: Author results)
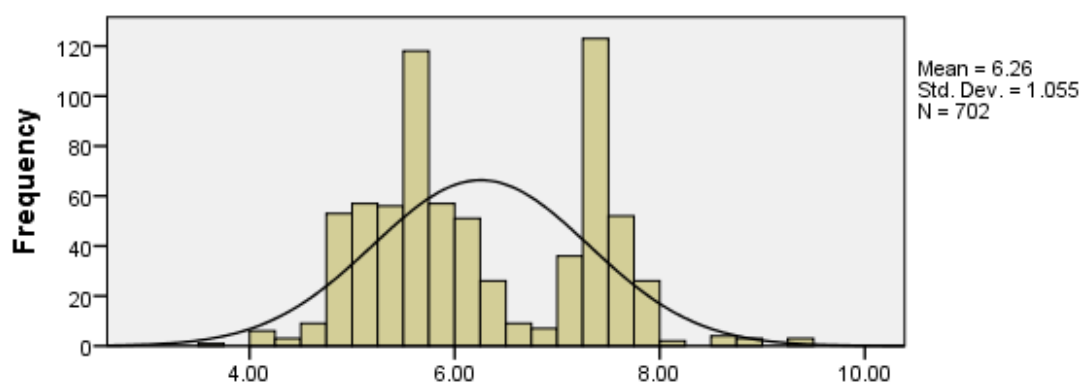
Figure 6-35 – Calculated networks relative score (Source: Author results)
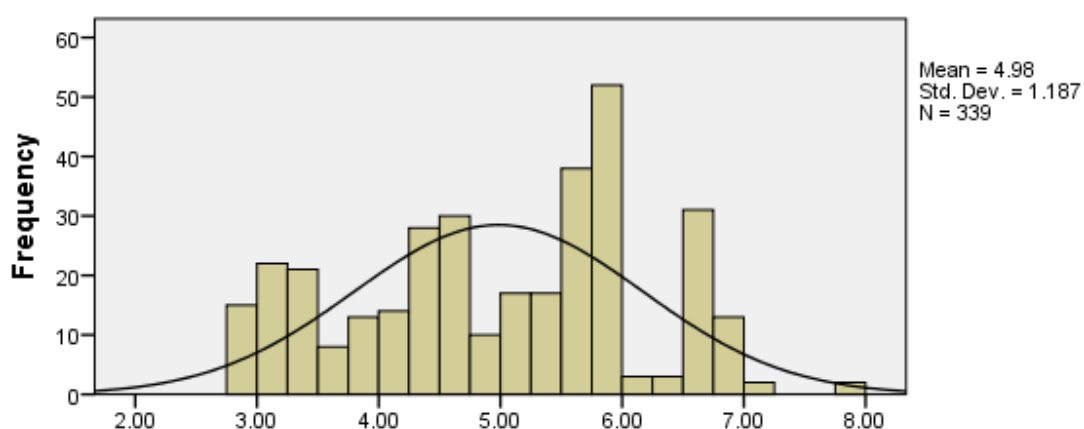
Figure 6-36 – Calculated norms relative score (Source: Author results)

6.6. Social Capital Network Analysis (Spatial Mapping)

In this section, the previous results from the field survey are examined in terms of relations between actors and how these relationships manifest in space in the city of Damietta. The network analysis starts with abstract network mapping (non-spatial), and is then overlayed on Damietta's map to process these same relations as represented in the urban setting. The abstract network analysis would give insights on how the industry functions and the social capital related patterns that exist within Damietta's furniture industry. The spatial mapping to follow would allow for a deeper understanding of the spatial aspects, proximity and commute between workshops and how this correlates with the social capital network concentrations in the city.

6.6.1. Social Capital Network Analysis (Non-spatial Network)

6.6.1.1. Network Visualisation

Visualising the connections between actors in the survey revealed interesting relationships and reflections on the industry in Damietta. Some concur with the initial hypothesis of this research, while others present new perspectives on the context and dynamic studied here.

The network as visualised separately from geolocation reveals a pattern of smaller networks between enterprises that mainly relates to their position on the supply chain. This also relates to the small scale of the enterprises and how almost all actors in this network are not of high power in the market with a large variety of connections (also reflected in some of the measurements below).

There are a limited number of nodes that exhibit higher level of connectivity, and this would suggest that these enterprises are either bigger in scale of work and connections in the market, or possess higher skills in their precise business activity, which would justify their higher connectivity. That said, these nodes do not exhibit great influence on the larger scope of the network in Damietta.

Most of the network connections are linear in form, which also reflects on the business connections being a direct related to the supply chain interactions.

Due to the scale of the study, some data might be missing from this picture, which needs to be stated as an acknowledgement of limitations and/or biases. A factor that limited the network mapping is that most of the influential factories and bigger businesses are located in New Damietta, which is not part of the study. Another aspect is that for the sake of time and respondent involvement, the survey was designed to ask respondents to list three of their contacts. With this suggestion, most of respondents provided up to three connections, which would not provide a full preview of the extent of their network.
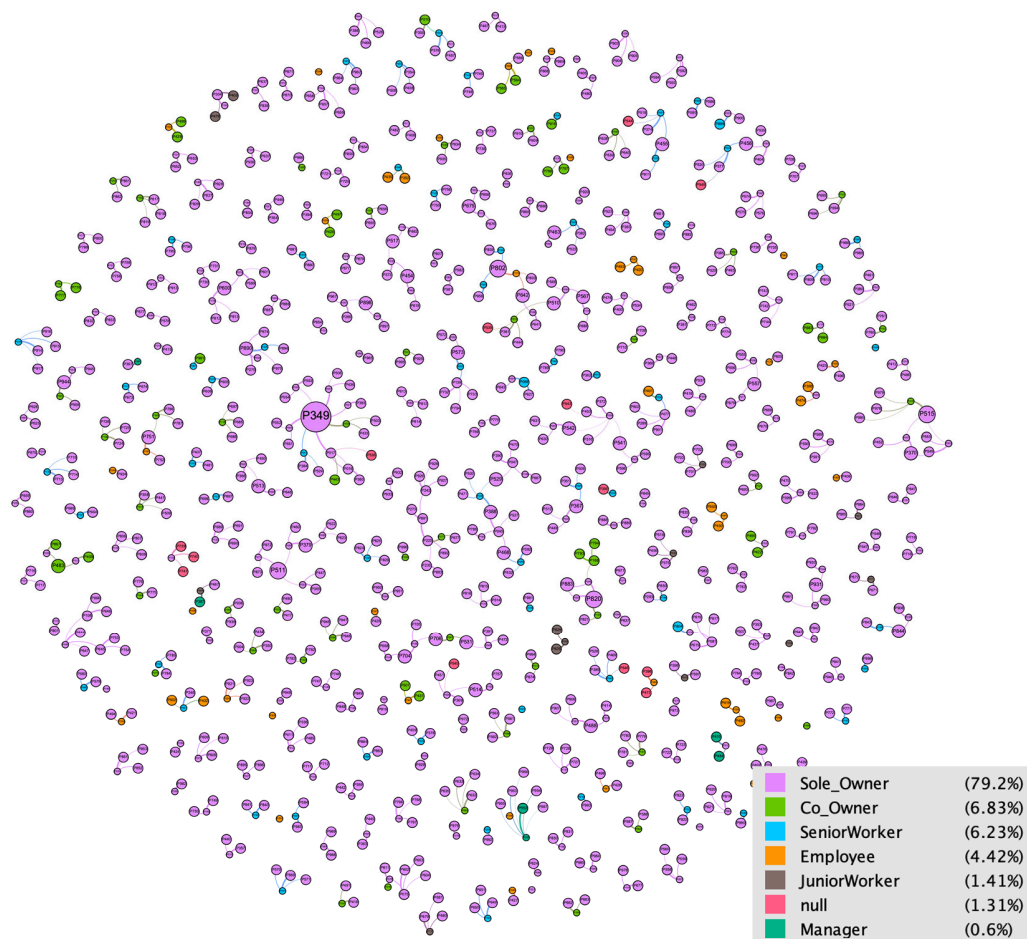
Figure 6-37 - Social capital Network Visualisation – Social (Source: Author analysis)

The network has 967 persons/vertices with 716 connections/edges between them. More information can be understood about the network through measuring parameters that would unveil the characteristics of these connections. These are explored in the below sections.

6.6.1.2. Clustering and Relationships

Observing the clustering pattern of the network as in the below Figure 6-38 shows that the network (as reflected from the survey entries) consists of a collection of smaller networks that are clustered separately from one another, with some connections between some of the clusters through centric nodes (highly connected nodes).
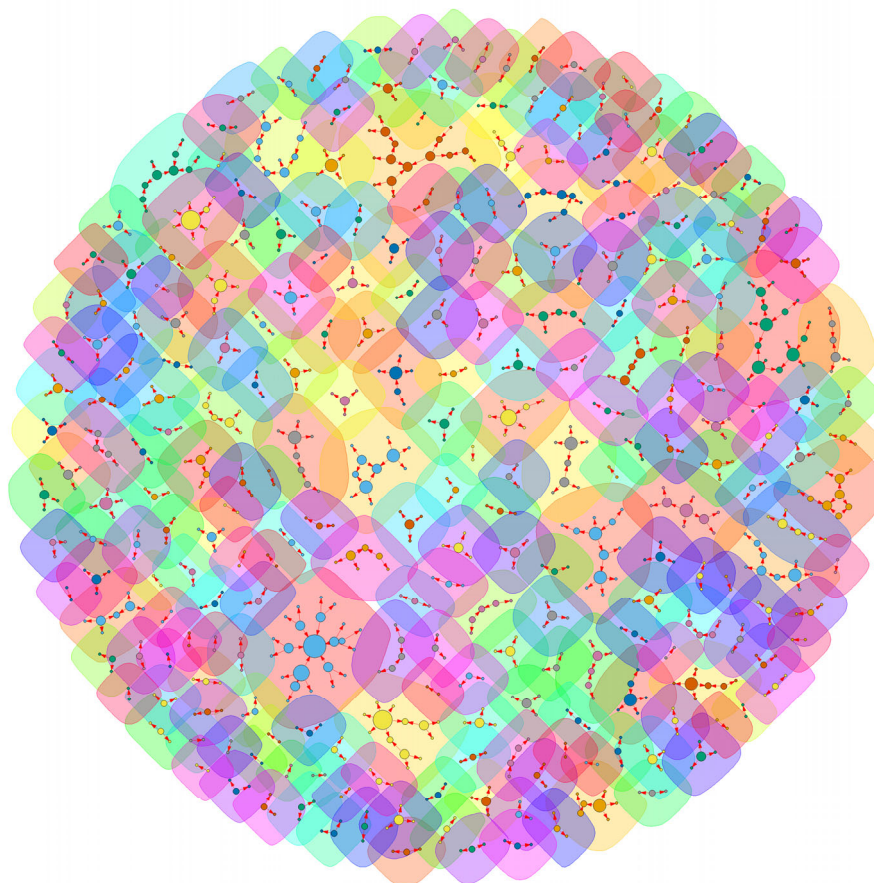
Figure 6-38 – Visualising Network Clustering in Damietta (Source: Author analysis)

This data supports the research's understanding of the nature of the furniture industry in Damietta as being small and micros enterprises and implies that the sample is highly representative in terms of reflecting the existing patterns of the industry in the city.
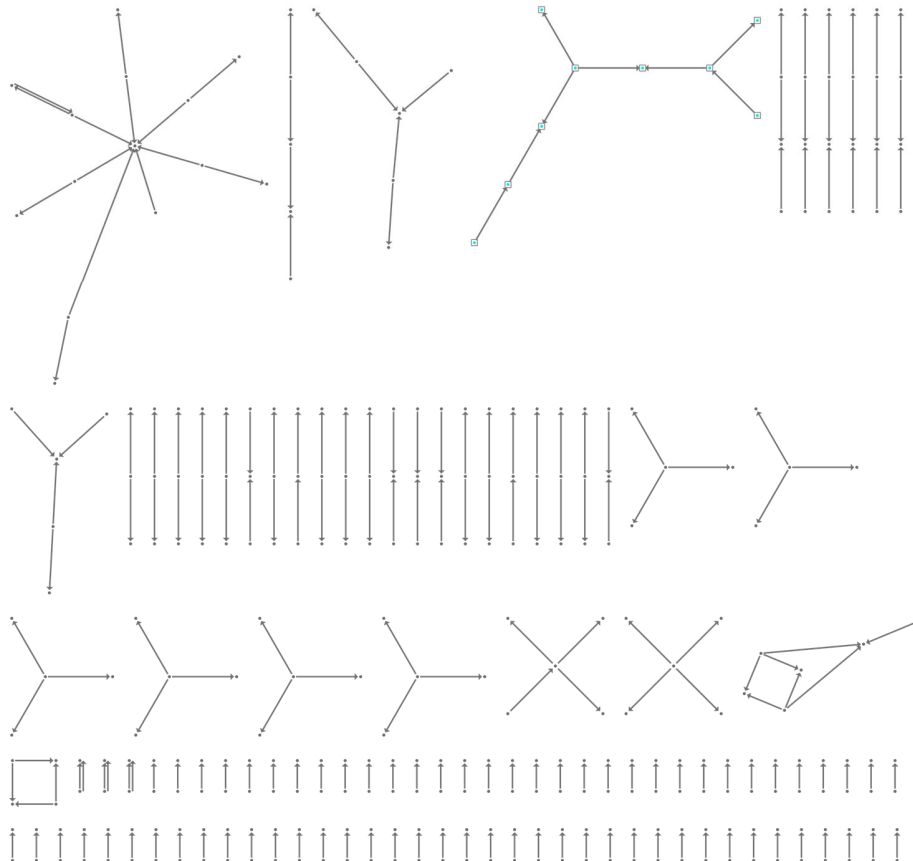
Figure 6-39 - Social capital network in Damietta – Types of clusters (Source: Author analysis)

The network connections have been summarised in Figure 6-39 above in an abstract node-edge arrangement, where the different types of clusters can be identified and analysed separately without any further input variables such as activity, ownership or others these variables are explored in detail in section 6.6.1.7 below. From the size and directionality of the bonds in different clusters, types of relationships can be recognised. The resulting types of connections

from the fieldwork mapping is affected by various factors. These include the survey execution logistics, accessibility, and respondents' willingness to share information about contacts. The sample connections can be representative of existing types of relationships yet cannot be deemed as an exclusive description of all types of social capital network patterns in Damietta.

The existence of different types of patterns and clusters in the network indicates the diversity in work processes and ways residents manage their production lines. This variety offers Damietta's industrial hub higher resilience than the conventional industrial patterns in standalone enterprises/factories. This is because in the case of Damietta, the compromise of one or more of the nodes within this network would not affect the total functionality of the whole network since different enterprises work dynamically in different ways. In a way, Damietta's social capital network functions as a vernacular block chain structure (Min, 2019), which in itself is quite a distinctive value unique to the setting. The network in Damietta contains different levels of collaboration, communication and transactions between actors, with compartmentalised business and production lines that function separately, but at the same time indirectly relate to the overall hub functionality.

Cluster 1 (Figure 6-40) has been examined as an inclusive example of connections in the network, as it is the biggest identified cluster between 14 users within the sample. It is a rich cluster of connections with different variations of social capital patterns. Node A represents a central person with great social capital in the industry in Damietta, as A was a referred trusted contact by 6 other people in the survey. The presence of A is reference to the strong social capital between enterprises in the industry, as well as a reference to the power that A holds in the market.
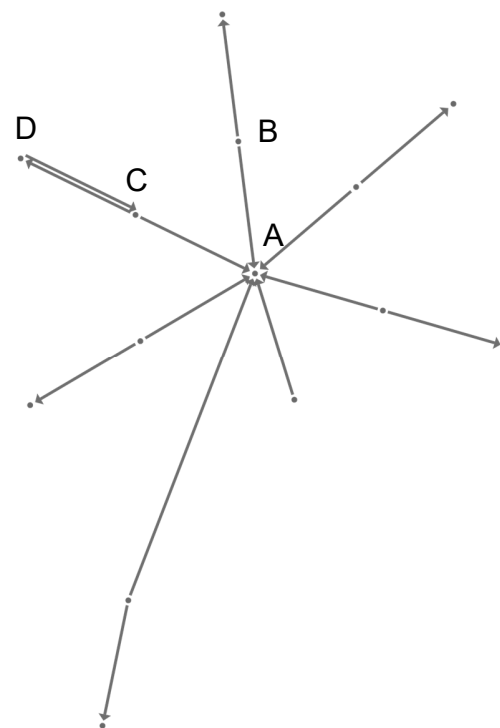
Figure 6-40 - Cluster 1 (Source: Author analysis)

Node B is a typical respondent who referred 2-3 contacts in the industry but was not reciprocally referred by other respondents. This might be related to the sample size rather than lack of connectivity. This is a limiting factor taken into consideration within this research that even though the sample is statistically representative of the population, the types of connections cannot be fully captured, where more patterns could arise with larger sample sizes that approach the population size (big data approach). Node C exhibits a different pattern of connectivity, where C is a respondent and a contact as well. This is clear from the two-way referral between C and D. This is a strong reference to the strength of social capital in enterprises, who has been recommended by another respondent independently. This pattern is repeatedly exhibited in different clusters within the network.
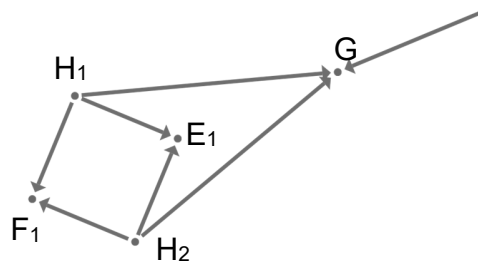
Figure 6-41 - Cluster 2
(Source: Author analysis)
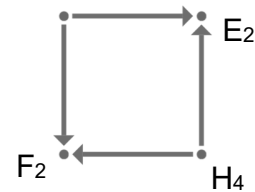
Figure 6-42 - Cluster 3
(Source: Author analysis)

Other types of patterns (relationships) can be identified in clusters 2 and 3 as well. Nodes E, F and G are nodes that have been identified together as part of the workflow of different respondents. This implies that there is a correlation between the activities of these enterprises, where their services are needed in conjunction with one another along the supply chain.

The larger the sample and connections, the more inclusive relationship patterns would arise. According to the current research sample, conclusions on the spotted patterns are made according to the examination of different variables in section 6.6.1.7 below.

6.6.1.3. *Network Diameter*

The longest distance between nodes within the network highlights how linear or centric the network is at its maximum connection (from one end of the network to another). In the case of Damietta here, the network diameter (undirected connections) is **9**. This indicates that there are a maximum of 9 connections between one person and another along the network. This implies the possibility of a linear network in some cases, which reflects on connections being linked to the supply chain – even if this is not the case for most connections in the network.

6.6.1.4. Network Density

Potential Connections (PC):

$$PC = \frac{n*(n-1)}{2} = \frac{992*(992-1)}{2} = 491{,}536 \; potential \; connections$$

$$Network \; Density = \frac{Actual \; Connections}{Potential \; Connections} = \frac{716}{491{,}536} = 0.0015$$

The network density figure is quite low for Damietta's case. This is related to various factors, one of which is that this network is a vernacularly evolving social network that does not include digital transfer of information. Networks with digital content tent to have much higher densities than vernacular networks. Another factor is the scale of enterprises in Damietta being mostly MSMEs, which implies that the bigger network consists of smaller networks connected to one another rather than connections between all actors.

6.6.1.5. Average Path Length

The average path length throughout the network is **1.088**, which indicates that the network is highly efficient with almost direct relations between all nodes. This reflects negatively on the density, which is discussed earlier, as the denser the network, the higher the figure for path length.

6.6.1.6. Degree Centrality

Degree analysis refers to the number of connections that each node has in the network. According to the histogram below (Figure 6-43) more than 600 persons in the network have one connection. Around 200 persons exhibited 2 connections, while the number of people with 3 connections being around 100 and decreasing upwards. A few connections have higher than 4 connections in the network with 7 connections being the maximum.
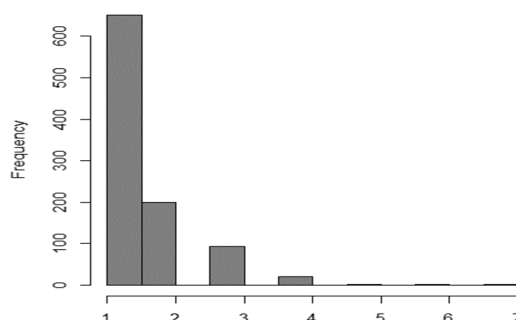
Figure 6-43 - Histogram - Node Degree Frequency (Source: Author analysis)

6.6.1.7. Sample Cluster Variables Analysis

To examine the network in more details, a sample cluster has been exhibited in figures Figure 6-44 and Figure 6-45 below as a comparative analysis of the nodes and edges with reflections on the nature of the nodes and the different relations from the dataset. The cluster includes three connected centric nodes with links to singular enterprises. A primary observation from Figure 6-44 A1 is that there was an overlap between respondents and contacts in the network, i.e. respondents (R) have also been nominated as contacts (reciprocal link), which highlights the interconnectivity between the industry community in Damietta.

Observing the enterprise activities in the cluster implies that there are more furniture trades and carpentry workshops in the city, with the nodes working with many of them being the other activities workshops such as upholstery, transport services, wood import and other, which exist in much smaller numbers in the market (Figure 6-45 B1). Furniture trades and carpentry also work on different levels in the market. Most enterprises (approximately 85%) are owners and co-owners of their businesses (Figure 6-44 A3). This reflects on the entrepreneurial structure within Damietta. Similarly, in Figure 6-45 B2, most respondents own their workshops rather than renting them, which supports the same rationale. This also implies that the edges in this network are mostly links between people in the same level in the market (enterprise owners and entrepreneurs). This can be further investigated in relation to the result from survey analysis of authority in the market (Figure 6-50 in section 6.6.2.1). Figure 6-44 A2 shows that most

respondents were born and raised in Damietta, and others lived most of their lives in Damietta (even if they left for some time). This is also in line with the research's hypothesis of the long-term social capital in the city. The same figure also highlights a direct relation between the years lived in Damietta and the centrality of the node (node degree).
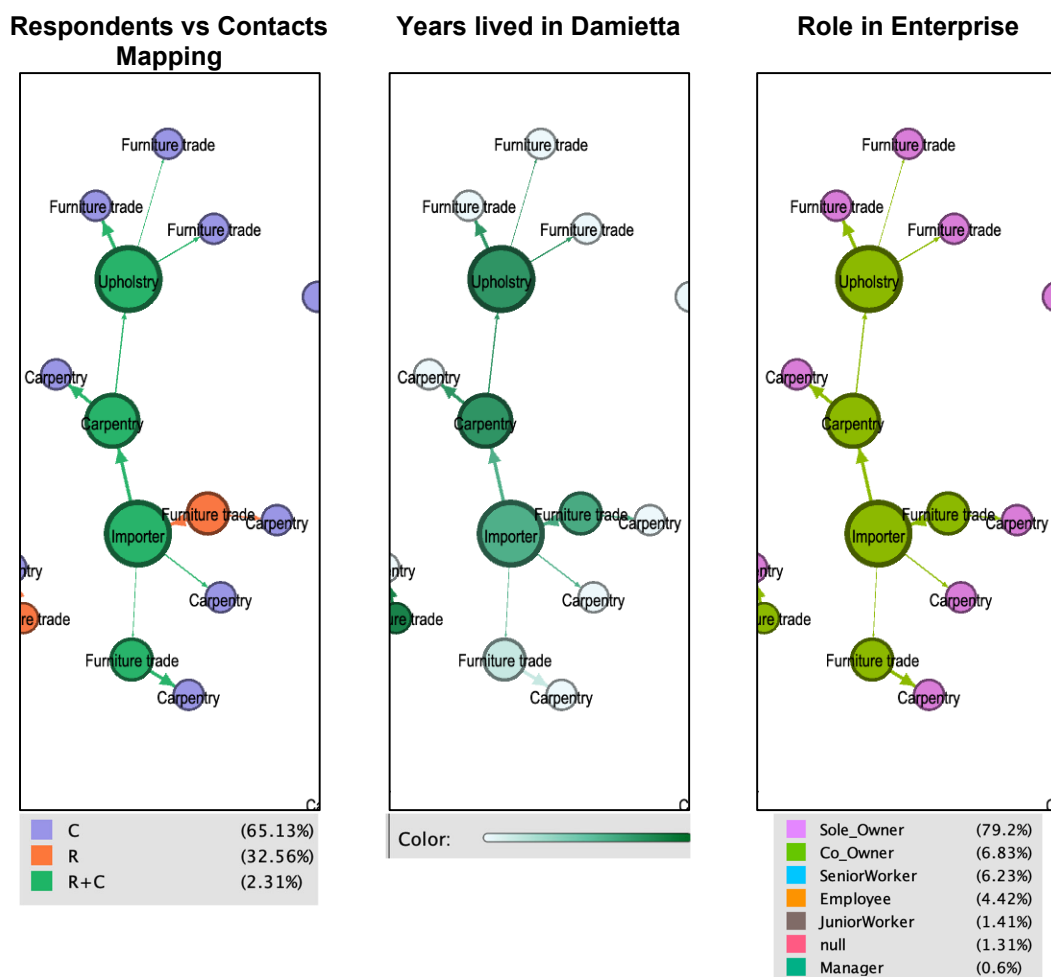
Figure 6-44 - Sample Cluster Analysis – A 1, 2, and 3 (Source: Author analysis)

Another layer of analysis on this sample cluster is that in Figure 6-45 B3 that related more to land use and the life-work patterns previously identified in Figure 6-11. Most respondents work within workshops that are part of a mixed-use

building. Only a small percentage is a purely commercial land use. This supports the argument of Damietta's furniture industry being related to the community's lifestyle rather than just being an economic base or source of income.

	Enterprise Activity	
Carpentry	(24.32%)	
Furniture trade	(21.61%)	
Staining	(2.41%)	
Furniture Trade	(2.21%)	
Upholstry	(1.81%)	
Transport	(1.81%)	
Veneering	(1.61%)	
Carving	(1.01%)	
Importer	(0.5%)	
Packaging	(0.5%)	
Upholstery	(0.5%)	
Gallery	(0.4%)	
Wood Trade	(0.4%)	
Middleman	(0.2%)	
Machinery trade	(0.1%)	

Ownership of Enterprise	
Owned	(13.57%)
Rented	(1.61%)

Type of Enterprise (mixeduse vs commercial)	
Mixeduse	(23.42%)
Commercial	(3.82%)

Figure 6-45 - Sample Cluster Analysis – B 1, 2, and 3 (Source: Author analysis)

6.6.1.8. Kinship Analysis in the network

From interview data, the concept of families having different workshops and working together within the furniture industry has been mentioned numerous

times, which implies that part of the social capital relationship patterns is familial ties. From this notion, this aspect has been explored in this research as part of the investigation of social capital for Damietta.

Part of the collected data was first name and surname for each participant and their contacts (with ensured ethical considerations and data protection measures in place). This information was coded and used to analyse the possible kinship percentages within the survey sample based on a shared last name.

Table 6-41 - Frequency Analysis of last name recurrence in the sample (source: Author results)

Number of times a last name is repeated in the sample	Frequency
1	360
2	77
3	38
4	19
5	10
6	3
7	3
8	3
9	2
10	1
11	2
18	1
19	1
35	1

The above Table 6-41 shows different aggregated frequencies of surname recurrence within the sample. The most frequent surnames were mentioned 18, 19 and 35 times (one occurrence each). Most of the nodes (respondents and contacts) with shared last name were between 2 and 5 times, which suggests many families in Damietta would typically have between 2 and 5 different enterprises owned by siblings, cousins, or generations of the family.

As this analysis is based on surname, some familial ties have not been captured (relations from the mother side of the family – hence different surnames according to Egyptian community tradition). This would imply that further familiar

connections within the sample might exist but are not added in. This strengthens the assumption of familial ties being part of the social capital network in Damietta.

6.6.2. Spatial Social Capital Network Analysis (GIS Mapping)

6.6.2.1. Spatial Network Analysis

Following the analysis of network relations and patterns in an abstract non-spatial approach in the previous section, here we examine the spatial distribution of the survey sample and social capital network analysis as displayed on Damietta city map. The connections are examined as node-edge relations, then overlayed with different variables to analyse correlations between aspects such as enterprise activity, age range, profitability, and other. A series of social capital network maps have been produced below. It is worth mentioning that there are limitations in the spatial distribution as there was missing data of locations in some of the survey paper entries. The mapped locations are 520, with 200 connections spatially mapped on Damietta city and surrounding areas. As mentioned in the previous section, network mapping sheds the light on existing social capital network (and space-related factors such as concentrations and proximity). That said, the statistically representative sample cannot be considered sufficient representation of network patterns mapping, where in this case (unlike statistical generalisation), the bigger the sample, the more patterns that would possibly arise (big data approach).

The first layer of spatial analysis is the base map of Damietta city centre with the nodes identified (respondents and contacts) in Figure 6-46 - Damietta base map with mapped node locations (source: survey findings and Author analysis) and Figure 6-47. The respondents' locations are concentrated in the city centre as this is the focus area of in this research, while the contacts' locations extend to areas in the region, as these were referred by survey respondents. Most of both respondents and contacts are located in the city centre nevertheless. This implies the high concentration of enterprises in Damietta city.
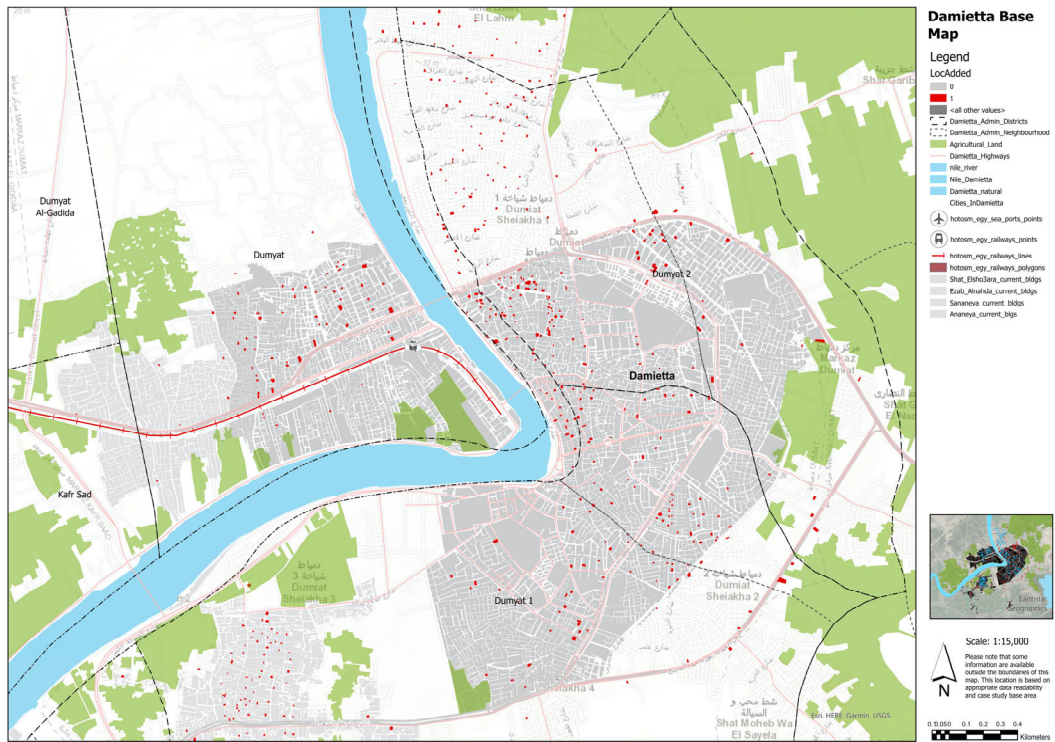
Figure 6-46 - Damietta base map with mapped node locations (source: survey findings and Author analysis)
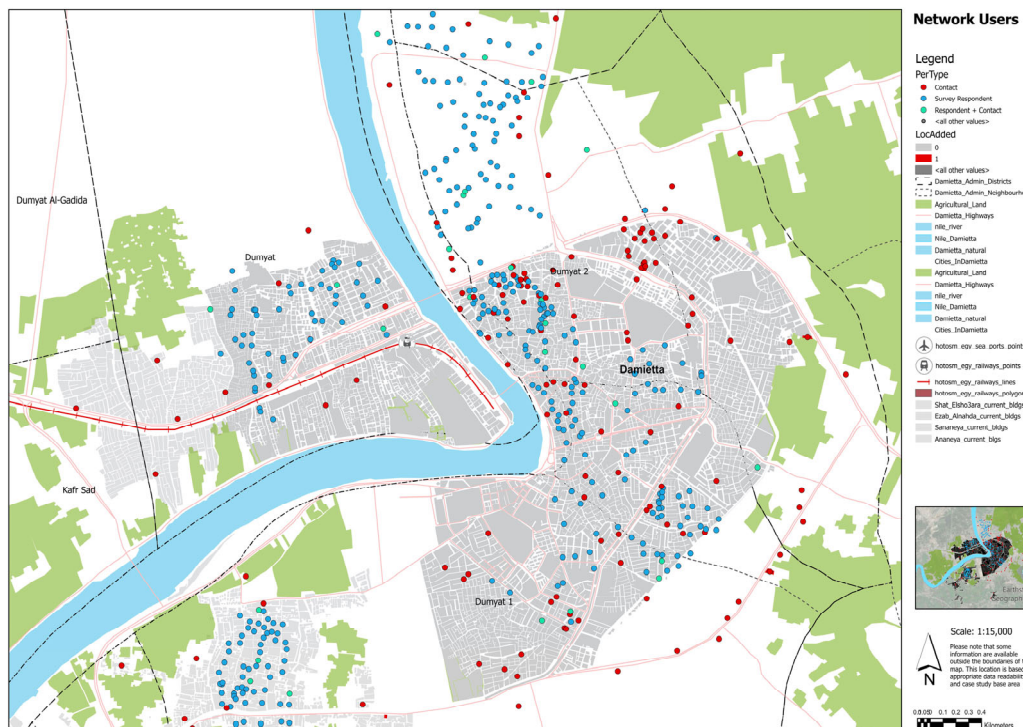
Figure 6-47 - Mapping node types (respondent, contact or both) (source: Author analysis)

The network map in Figure 6-48 shows concentrations of network connections in the central area of the city centre (area A), which is connected to other areas with similarly high concentrations in the city (areas B, C, D, E and F). The directionality of connections is not exclusive between any certain concentration areas, which implies that the whole city works as larger connected hub rather than smaller clusters. Area B (El-Sananiyah) is an area of concentration with major connections to city centre area A. Area C (El-Shoara) specifically has major connections to all different locations, which is related the concentration of staining activity in its enterprises (further explored below). The concentration of nodes in F relates to these enterprises being situated on to the main roads into the city from other neighbouring cities and regions. Similarly, area E is situated on one of the main roads on the edge of the city.

Figure 6-48 - Spatial social capital network map (node-edge connections)
(source: Author analysis)

Regarding enterprise activities, many respondents mentioned multiple activities within their enterprise (further details in section 6.5.1). This relates to the pattern of work that includes carpentry workshops working as a furniture trade rather than its main activity only. The following map (Figure 6-49) exhibits concentration of furniture trade enterprises in the city centre across different areas (A, E and F). Area C includes more staining workshops than other locations, as this reflects on the interviews results that revealed concentrations of staining enterprises in El-Shoara. Areas B and D show a variety of enterprise activities in the same place, who possibly work with the central furniture trade enterprises in A, E and F. It is worth mentioning that areas B, C and D are representative of the patterns abundant in smaller towns and villages across Damietta region, where either a concentration of one craft or a mix of crafts exist in the urban area, with connections to the central furniture trade enterprises in the city centre.
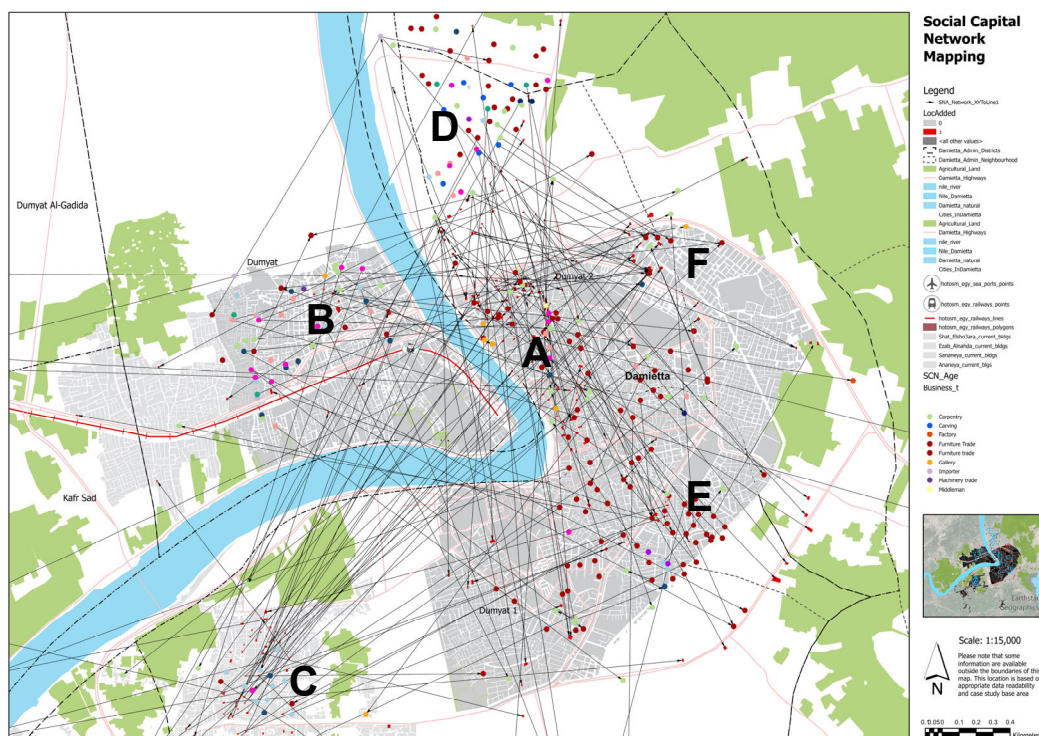
Figure 6-49 - Spatial social capital network map - Activities distribution (source: Author analysis)
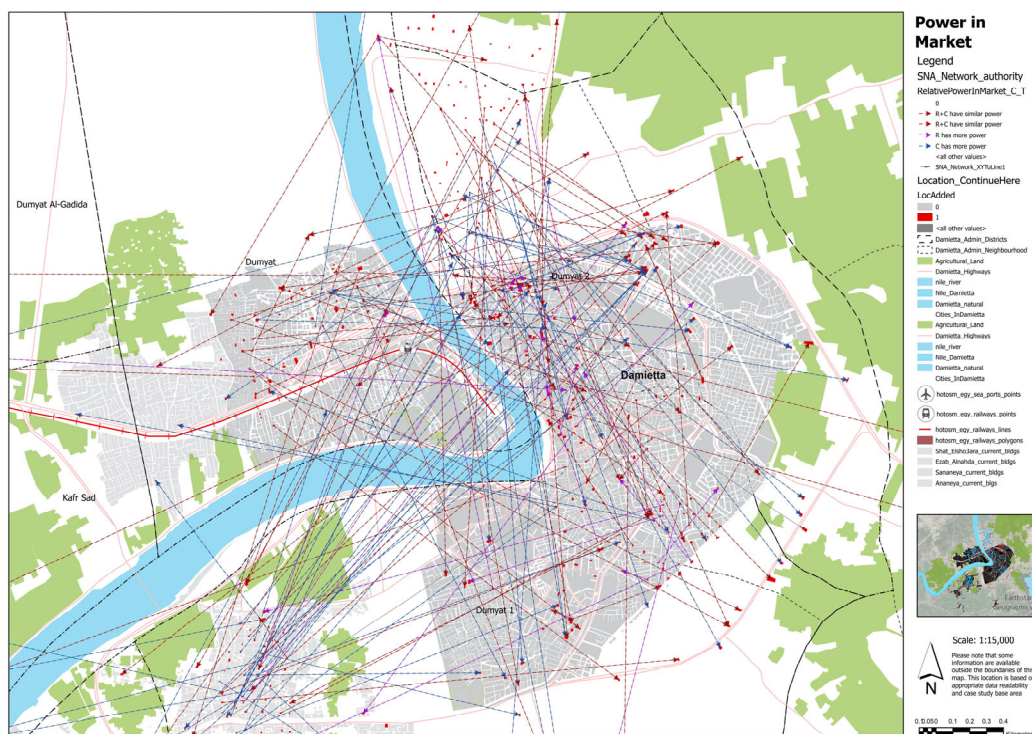
Figure 6-50 - Spatial social capital network map – Perceived power of actors in the market (source: Author analysis)

Another significant aspect spatially mapped is the perceived power of actors in the market as compared to their contacts (directional connections/links with source and target), illustrated in Figure 6-50. Respondents were asked whether they have more power in the market that their contacts, vice versa, or they both have similar level of power or influence in the market. This has been statistically examined in the survey analysis in section 6.5.5 where the highest percentage of responses mentioned a balanced level of power in the market between actors. When overlayed on the map, this is also seen in the abundance of this balanced power levels distributed all across the map (red arrows). The exception to this is area C, where there is a clear increase in blue arrows representing that respondent (source) power is higher in the market than the contact (target). This reflects that enterprises with specialized activity hold high power in the market. This also indicates that the clustering of staining enterprises in area C has

contributed to these enterprises having higher power collectively than other staining workshops scattered in other areas of the city.

6.6.2.2. Spatial Clustering Patterns

In section 6.6.1.2 above, clusters were investigated in terms of types of relationships and how these reflect on industry patterns and actions between nodes/enterprise owners. Here, these clustering patterns are examined in urban space, where aspects of proximity, commute and production become relevant. There are various relations that arose from the data mapping as below (investigated pattern highlighted on the map series).

Cluster 1 highlighted in Figure 6-51 is the biggest mapped cluster in size and number of nodes. It can be seen that the nodes are distributed between three main areas (A, C and D). The central node within this cluster is in area C, which is a specialised staining workshop. This highlights a pattern that furniture businesses/trades in central areas have specialised workshop connections in surrounding areas who they trust to finalise work. This is also an indication that the central node workshop has a high skillset, which is commended by different businesses for this part of the production chain for their orders. Commute between areas A/D to C is through the riverside main road, with commute time range of 10-15 minutes by car/truck (source: google maps).

Similarly, cluster 2 (Figure 6-52) shows yet another connection between areas C and D, which reiterates on the relations between businesses and specialised workshops.
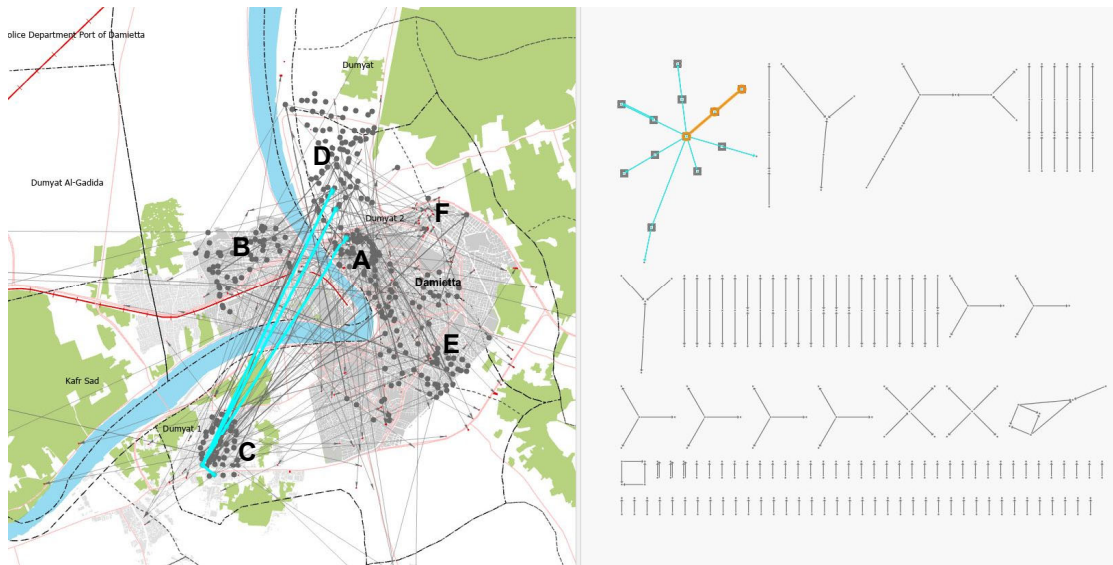
Figure 6-51 - Spatial cluster mapping - Cluster 1 (source: Author analysis)
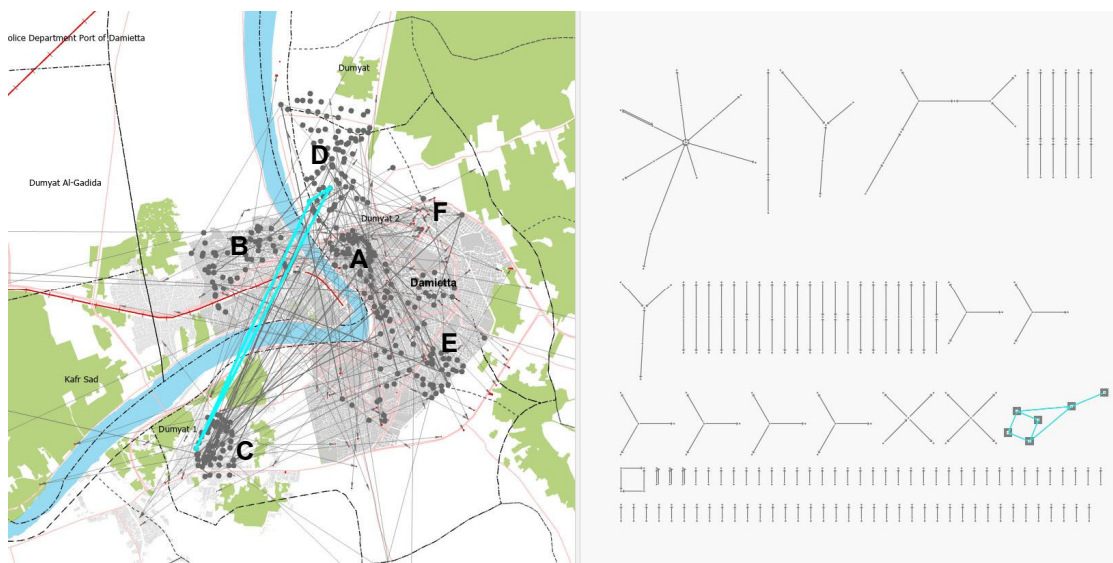
Figure 6-52 - Spatial cluster mapping - Cluster 2 (source: Author analysis)

Cluster 3 (Figure 6-53) exhibits an important pattern that has been mentioned in interviews as well, which is that workshops in the same street would work together, resulting on an almost complete production chain coexisting in the proximity of a single street. All nodes in this cluster are located in the same area and along the same street. The fact that most workshops in this area are mainly

carpentry and furniture trades indicates that they would complement one another through working on different type of product, or through providing support to each other as they possess a similar skillset.

Cluster 4 (Figure 6-54) is also another bigger sized cluster in the network, which shows connections between areas A, B and C. Similar to clusters 1 and 2, even though area A is the geographically central location in the city, it is clear that workshops in area C (representing specialized workshops) are the central nodes within this social capital network, as their skillset is vital to the production process of the trades enterprises within all the other areas. It is expected that such a central role exists in other smaller towns and villages in Damietta region (outside the focus scope of this study, nevertheless relevant to the wider understanding of the context).
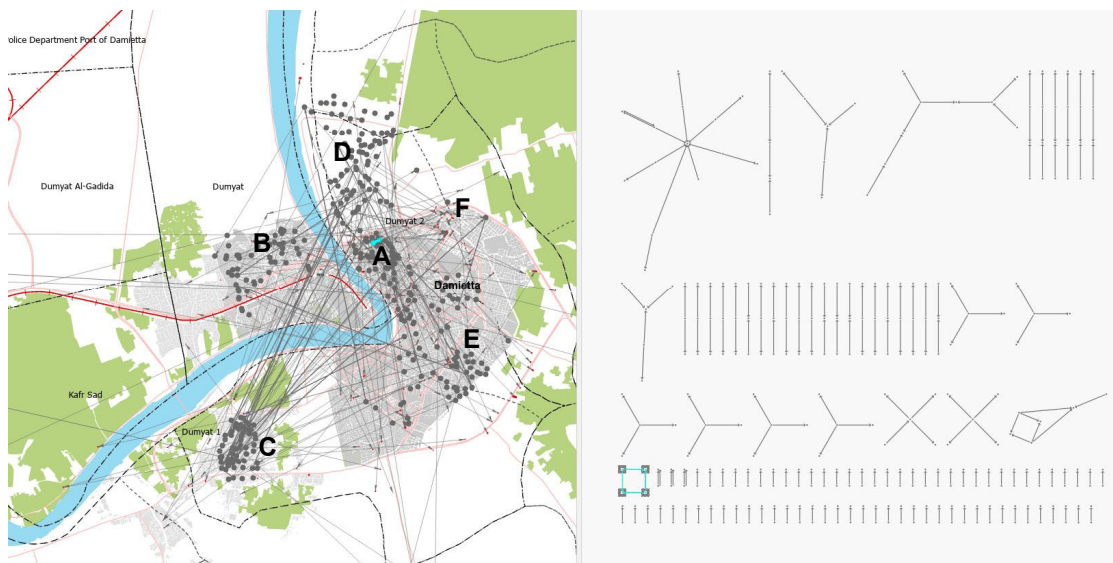
Figure 6-53 - Spatial cluster mapping - Cluster 3 (source: Author analysis)
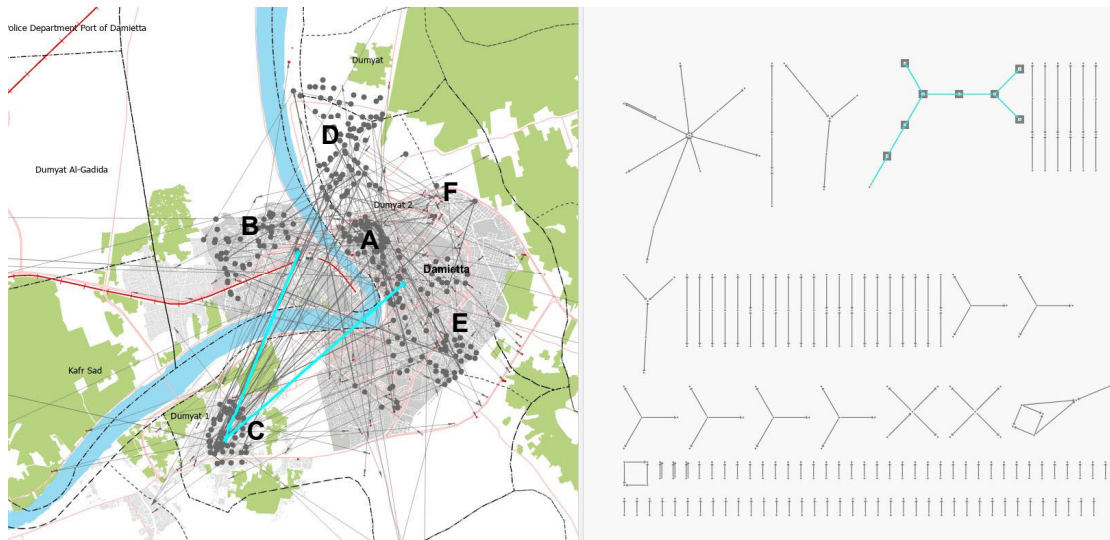
Figure 6-54 - Spatial cluster mapping - Cluster 4 (source: Author analysis)

Cluster 5 (Figure 6-55) shows connection between B and D located on either side of the Nile. The spatial connection here would be through the two bridges in Damietta city, putting commute between the areas at 10-12 minutes (source: google maps). It is worth mentioning that that this cluster is a linear arrangement, which implies this is part of a bigger cluster that might not be captured in this sample, as the linear connections would most likely grow into a similar pattern to clusters 1, 4 or 6.

The last cluster examined here is 6 (Figure 6-56), which exhibits a central node that connects different production lines. This node is located in area D, while the connected nodes are in C and D. This relates to the diverse types of workshops in area D, which are likely to create continues production lines in the same area/geographical proximity to one another. C continues to be a central area in this network as a specialized area in staining workshops.
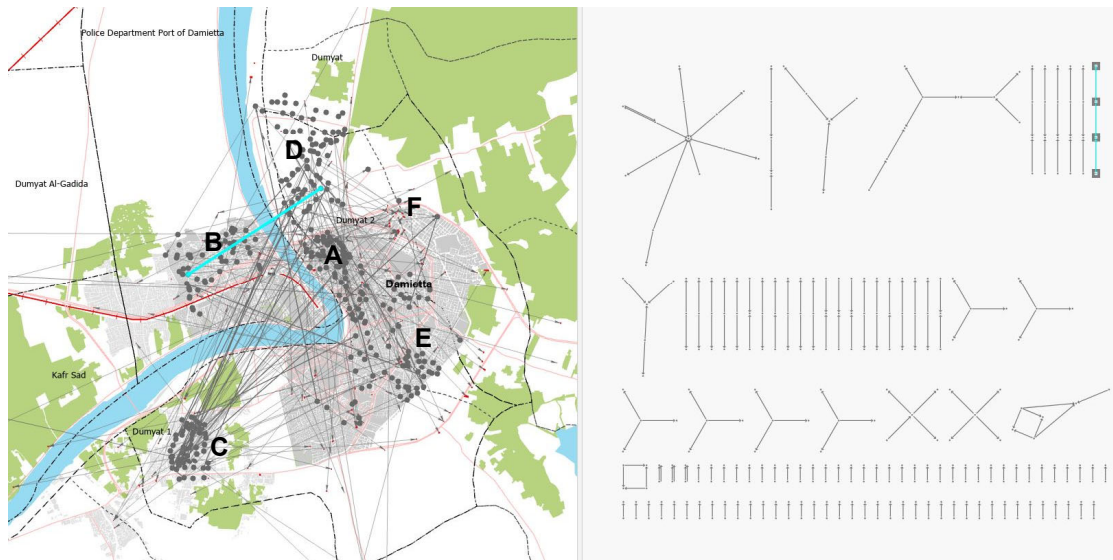
Figure 6-55 - Spatial cluster mapping - Cluster 5 (source: Author analysis)
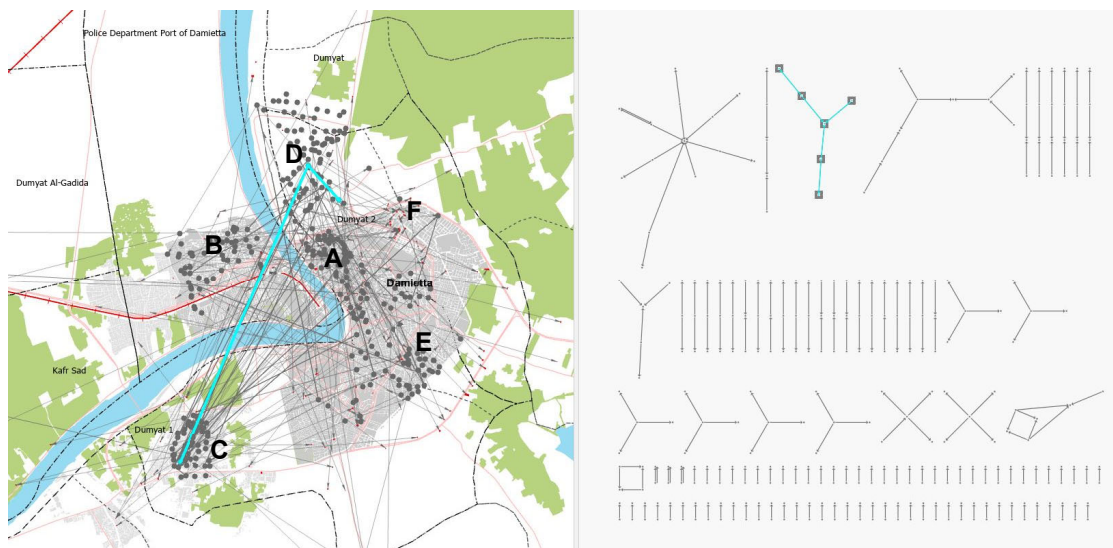
Figure 6-56 - Spatial cluster mapping - Cluster 6 (source: Author analysis)

The different patterns identified above offer a glimpse of the diversity of the vernacularly diverse social capital networks in Damietta. As the sample increases in size, more patterns are expected to arise. These findings in addition to the other data collection methods presented in this chapter offer a comprehensive account of the social capital network of Damietta from both

qualitative and quantitative angles, to provide insights into details of the industry, as well as a breadth of analysis of the bigger picture from the geospatial mapping.

6.7.   Chapter Summary and Key Findings

This chapter provided a detailed account of the collated primary data from the different methodological tools in this research. This includes data from interviews, observations, field survey, geospatial mapping, and network analysis. This data has been synthesised into comprehensive layers of exploratory and evaluative analysis (qualitative and quantitative) that aims to respond to the original hypothesis and research question. These findings and analyses were correlated with the previously reviewed literature (Chapter 2 and Chapter 3), as well as the context secondary data in Chapter 5, resulting in informed discussions and recommended actions for development (Chapter 7).

The findings from this chapter can be summarised as follows. These aspects are **brief key statements** from the analysis that form the basis for the discussion and recommendations synthesised in Chapter 7 below.

- Data shows a tangible correlation between social capital abundance in Damietta and the spatial distribution and proximity of MSMEs within the city (section 6.6.2).
- Interviews and network mapping revealed areas of concentration of MSMEs according to type of activity or type of product (sections 6.2.3.5 and 6.6.2).
- The power and control in market among MSMEs in Damietta is homogeneously distributed, unlike the expected power relations in a capitalist alternative (section 6.5.4).
- Supply chain patterns in Damietta are different and heterogenous, which offers various paths and ways of working within the industry (section 6.2.3.1).
- There are missing components in Damietta's supply chain (available in a standardised furniture production line), which affects the industry's development and growth (section 6.2.3.1).

- Social capital network in Damietta manifests different types of clusters and mini-networks that overlap and work in parallel to one another (section 6.6.2.2).
- There is a high percentage of kinship relations in Damietta's furniture industry community as reflected from the representative survey sample (section 6.6.1.8).
- There is a missing link between local governmental organisations such as Chamber of Woodworking and Furniture Industry (CWWFI) and the MSMEs community in Damietta. This reflects on the resources offered by CWWFI and the needs of the MSMEs owners and workers (section 6.2.3.6).
- The perception of the community of Damietta Furniture City (DFC) project is negative and fearful, in addition to the missing communication between the role of DFC and the potential mutual benefit resulting from global exposure.
- Education and vocational training is an area of deficiency in Damietta and the furniture industry in Egypt.
- Industrial links to the global market are limited to a certain scale of enterprises, and relates to connections with entities such as CWWFI.

7

CHAPTER 7 – CONCLUSION, DISCUSSION AND RECOMMENDATIONS

7.1. Introduction

This chapter illustrates comprehensive links between the various components in this thesis, including the critical review of literature, context analysis, data collection and findings synthesis. These links and conclusions reflect on the original inquiry and hypothesis of the research and form the evidence addressing the main aim of this work. How the research objectives have been met in this work is also presented. The concluding account in this chapter also brings together the quantitative and qualitative results into recommendations for development based on social capital networks in the furniture industry in Damietta. The discussion presents the contribution of this research to the body of knowledge and outlines the possibility to conduct further research in the subject. The limitations facing this research and how these were handled is also presented as post-research critical review of the methodology in relation to on ground barriers.

7.2. Research Contribution to Knowledge

The main contribution of this research can be summarised in providing a novel interdisciplinary lens to examine, map and quantify the relationship between Social Capital Networks and the socio-economic dynamics of space in the context of grassroots industries in cities. This is through formulating a

comprehensive theoretical approach and practical tool that together capitalise on the overlap between Social Capital Theory (Coleman, 1990), Network Theory (Lin, 2001), Competitive Advantage Theory (Porter, 1990) in light of the adopted quantitative geospatial methodology and tools. Previous research in Social Capital has focused mainly on the qualitative mapping of user experiences (separate from spatial interaction). **Hence the novelty of this work lies in the data-driven quantitative approach to understanding and mapping Social Capital as a dynamic spatial network in the city, which opens prospects of a different type of analysis and approaches for urban development based on this hybrid spatial and socio-economic perspective on urban economic interactions in industrial cities.**

The abovementioned overarching contribution to knowledge can be broken down into theoretical contribution and empirical contribution (Corley and Gioia, 2011). Understanding what this research offers in a more categorised manner sheds light on the particularities of each stage of the research design, methods, data collection, analysis and results, and explores the details of further established contributions presented through this work on a variety of targeted scopes. These are explained as below:

From a theoretical point of view, this research offers contribution in terms of **incremental originality** (Corley and Gioia, 2011), as it adds to the body of knowledge that relate network theories and mapping to social capital and the socio-economics of industries in cities. Spatial mapping of social capital is also a new research approach adopted in research in the past few years. This thesis contributes a precedent for mapping the spatial aspects of social capital in a Global South context of a semi-rural economic cluster such as Damietta. The other aspect that measures the extent of the theoretical contribution of this research is its **utility or usefulness** (Corley and Gioia, 2011). This research offers the **scientific utility** of providing a mixed methods approach to explore social capital in a quantitative and spatial light, unlike the widely adopted

qualitative measurement of trust, networks and norms in literature. In terms **practical utility**, the methodology introduced in this research can be applied by decision makers both locally in Damietta and nationally for similar industrial city contexts whether in Egypt or other countries. The methodology and framework presented here offer a tool to map the magnitude of social capital as an asset towards sustainable community-oriented development (SDGs 8, 9 and 11 – this is expanded upon in the following discussion section). This approach can also be of use to MSMEs owners to inform expansion of their business in relation to the market (recommendations in section 7.4.3 based on thematic analysis in section 6.2.3 and examination of industry statistics in Chapter 5). This latter impact can be considered a methodological as well as theoretical contribution. The theoretical and methodological contribution also comprises the devised theoretical and spatial framework in this research, which was the basis of the mapping of social capital in Damietta. The framework also offers a useful **data-driven tool** for socio-economic development of urban economic clusters (as per framework design and validation in section 4.9). This framework can be appropriated and verified for different contexts (industries) and cities in further research.

Regarding empirical impact, this research provides a significant **empirical contribution** through collating and creating a **new statistical and spatial dataset** (sections 6.5 and 6.6.2) on the social capital and other socio-economic aspects of the furniture industry in Damietta (survey-based dataset utilised for the mapping in sections 6.5 and 6.6). Prior to this research, there was no existing data on social capital for any of the industrial urban clusters in Egypt, nor focus in census data on furniture industry enterprises in Damietta or nationally (this is through examining CAPMAS statistical and GIS data (2019a) in addition to previous literature in the field). The official CAPMAS spatial layers explored generic land use information with little investigation of industry or social capital-oriented information. The dataset produced in this research can be utilised for

further investigation of other factors related to data-driven urban development approaches in Damietta (as investigated in section 6.6.2). It can also be used in the investigation of possible expansion of Damietta's economic cluster regionally and nationally (exploring overlaps between existing secondary GIS datasets in section 6.4 and the primary GIS network mapping dataset in section 6.6.2). This novel social capital mapping dataset also serves as **cross-sectional documentation** of the status of social capital networks within the furniture industry in Damietta at this point in time. This includes connecting the spatial mapping with the dynamics that shaped this unique economic cluster with its intertwined urban patterns (section 6.2.4). It is also linked to the challenging local and global socio-economic and political pressures the industry and community face today in Damietta (sections 6.2.3.2, 6.2.3.4 and 6.2.3.6). The spatial mapping can also be seen as a base map for **climate change resilience planning** in Damietta for safeguarding the industrial node of the furniture industry (overlapping sea level rise mapping explored in section 1.5.5 with social capital network mapping in section 6.6.2).

7.3. Discussion

7.3.1. Original Inquiry and Hypothesis

The primary argument to discuss is the reflection of the research outputs on the proposed hypothesis, which was that social capital is correlated with the spatial distribution of MSMEs in Damietta's furniture industry (Hypothesis in section 1.6). According to the network mapping results (section 6.6.2), this has proven to be true on different levels. On the city scale, the commute time between different areas in the city is maximum of 10-15 minutes, which allows for effective communication and relocation of goods at different stages of the production line. On a smaller scale (neighbourhood or area), concentrations of different activities/commodities have been identified (for example staining workshops agglomeration in ElShoara – Figure 6-49). The spatial proximity on a city scale

was key in the development of these areas as mini hubs to produce a particular type of product or for workshops working in the same activity. This also means that clients and other workshops can more easily approach workshops for certain products according to their locations.

This connection between space and activity provides an additional angle to the work of Putnam, Coleman and Wallman on social capital theory (Coleman, 1990,Putnam, 2002a) and social structure and enclosure (Wallman et al., 2018). Literary work explored in section 1.9 and Chapter 2 provides connection between the abundance of trust and norms within the network density (also related to social structure degree of enclosure). The geospatial mapping presented in this work (in section 6.6.2) adds to this conversation the factor of spatial proximity and urban compactness as a driver as well as output and continuation or trust, existing networks, and norms (social capital components). It is a system that evolved vernacularly and is maintained and grown through keeping a balance between spatial proximity and high magnitude of social capital. This also provides evidence of the overlap between the geographical and economic discourses (Naughton, 2014) for the case of Damietta, where investigation of this economic cluster cannot be understood without considering both economic and geographical contexts.

It is important to mention that most social capital connections were between both enterprises across different mini-hubs or areas, as well as within one given area (Figure 6-48 and Figure 6-49). The connection varied according to activity and type of workshop rather than just spatial distribution.

Another part of the hypothesis was related to the affiliation of social capital to power or "control" in the market (Lin, 2001). The hypothesis proposed that workshops that are more connected would exhibit higher power in the market. Through interpreting the results of the spatial mapping and survey on perceived power in market (Figure 6-50 in section 6.6.2), an exciting dynamic was revealed.

Contrary to expectation, most respondents declared themselves and their connections at a similar place within the industry's power dynamic (survey question Q32b investigated in section 6.5.5). This indicates that the power division within the industry community is almost equally distributed among MSMEs with no extreme levels of powerful or powerless enterprises in the local market. This is an indication of an eco-localism economy (Curtis, 2003) rather than the expected capitalistic approach usually found in a largescale industrial cluster. This is a major positive indicator that would emphasise that the social capital and market dynamics in Damietta offer a sustainable model for industrial hubs that has vernacularly evolved and stabilised with more efficient and equitable context than other designed furniture hubs (for example DFC). This model offers potential fulfilment of SDGs 8, 9 and 12 (United Nations, 2021) as it allows for sustainable economic growth based on industry with a particularly efficient production dynamic in the city.

7.3.2. Supply Chain Investigation

The supply chain of the furniture industry in Damietta (collated from thematic interviews analysis in section 6.2.3.1 in Figure 6-8) has proven to be quite different from the standardised industrial production line documented in literature (in section 5.5, Figure 5-13). Some activities occur in conjunction with others, while some workshops (and areas/neighbourhoods) focus on a singular commodity (such as staining workshops agglomeration in ElShoara – Figure 6-49). That has contributed to keeping the traditional way of production in the market for decades, particularly when it comes to furniture design. The oyma (carving), as described in section 5.5.1, is one of the unique patterns of production of furniture designs in Damietta, where 3D samples are used as a manual basis of creating designs, rather than 2D computer aided designs. This craft is considered to be one of the unique aspects about the industry in Damietta.

The uniqueness of Damietta's industry supply chain stems from its vernacular nature and organic development. This implies that there is no obligation for

workshops to abide by a standardised production line requirements or process (this issue arose in interviews discussions analysed in sections 6.2.3.1 and 6.2.3.4). Through comparing the standard supply chain to the vernacular Damiettan production patterns, some activities/values have been overlooked within the latter system (Figure 6-8). Such commodities include marketing, quality control/assurance, value added services and after sales services (further investigated in section 6.2.3.1). As these overlooked activities are done organically within each workshop, there is a missing datum for ensuring such services are delivered and completed. This has resulted in missed opportunities (marketing-related) as well as low reliability issues with some clients as no after sale service is provided. These concerns have been addressed in recommendations for development in section 7.4 below. Addressing such concerns would also respond to SDGs 8, 9 and 12 (United Nations, 2021) fulfilment through ensuring the sustainable economic growth and industrial consumption and production of furniture in Damietta.

7.3.3. Social Capital Network

The analysis presented in section 6.6 shows that there is a wide variety of patterns and types of connections and clusters that coexist within the network and industry community. This diversity means that the total network in Damietta is more resilient than its equivalent standardised industrial hubs elsewhere, as the latter operates on a singular hierarchical pattern of production and management. With such diversity in patterns, disruption of one line of work or method of conducting business would have a limited effect on the whole network, and the rest of it can function separately and effectively. This can be applicable both for production lines as well as for spatial distribution (reflection of spatial distribution of clusters is investigated in Figure 6-51 to Figure 6-56). Hence, Damietta old city would be more resilient as an industrial hub to threats such as sea level rise than its equivalent DFC project which operates in a capitalistic

single-solution approach (even if the project design might be more efficient). This ties in with the sea level rise mapping investigation in section 1.5.5.

Examining the mapped furniture MSMEs network in section 6.6.1.2 also revealed that the network is not a collective single agglomeration, but rather a collection of numerous smaller networks that work as clusters within the bigger network. Each cluster functions separately as its own production line, yet they might overlap as workshops sometimes decide to undertake works with different enterprises than the ones they worked with previously. These connected clusters with key nodes and overlaps can be argued to resemble a blockchain technology system (Min, 2019); one that evolved vernacularly on an urban scale, not by design.

The network structure, power distribution and clustering (presented in this discussion section above) indicate homogeneity between enterprises (MSMEs) in terms of level or work, profit and craft significance (survey analysis in section 6.5). These factors shaped a solid basis for a trusting community with higher level of bonds between individuals. This argument is also supported in the works of You (2012) and Oberg (2011) stating that homogeneity is directly related to social trust and interpersonal trust within communities. The high survey scores regarding trust between enterprise owners in the industry also provide evidence of the positive correlation between trust and a homogeneous market (section 6.5.3). Although not particularly a positive aspect, the homogeneity in the industry community also extends to gender, where the industry is dominated by males (descriptive survey analysis in section 6.5.1). This is however an expected reflection of the male-dominated community norms and common tradition, which is typical for semi-rural contexts in Egypt. Interviews showed that there is a stronger female presence in the industry, yet is kept behind the scenes (section 6.2.2), as females are not expected or given the opportunity to lead or manage a workshop or business.

The proportionately divided power in the market (discussed in section 7.3.1 above) also indicates that Damietta exhibits a more closed community structure (Wallman et al., 2018) with high bonds but not many bridges and links (Gittell and Vidal, 1998,Hunt et al., 2015,Szreter, 2002,Szreter and Woolcock, 2004). This would mean that there is a strong local connection between furniture enterprises in the city, yet would also imply there is low connection to the global market or to markets in other cities in Egypt (survey analysis in section 6.5.5). This is one of the drawbacks of the current status of the industry in Damietta, one which might need support from different stakeholders (as suggested in recommendations in section 7.4 below).

Other aspects that arose from the data include that the industry activities on are not evenly distributed among workshops (section 6.5.2). There is a main focus on furniture trading, in addition to any other activity (e.g., staining, veneering or other). This implies the furniture industry in Damietta is a network of businesses rather than of craftsmen. The craft is part of the network, but the main link is business interactions. Another interesting angle was the existence of equally high magnitude of competition and trust among users in the industry (sections 6.2.3.3 and 6.2.3.4) separately from one another. MSME owners working within the same activity exhibit a high competitive drive that extends to decreasing prices to the same client to get the job someone else was commissioned for. At the same time, when working with MSMEs from different lines of work, the dynamic is trustful, and reliability is a key bond in all transactions. This can also relate to the low percentage of answers on survey questions regarding 'belief in collegiality' and working together for bettering Damietta's industry context (section 6.5.4). The highly competitive nature in the city's industry would drive same-activity workshops to fierce business rivalry.

On investigating kinship (in section 6.6.1.8) within the statistical sample (through last name statistical analysis), it was clear that a large percentage of the sample had familial relations and worked with one another as well. This is additional

evidence on the correlation between familial bonds and social capital between enterprises in Damietta. With long term generational connections between families, more business interactions and more trust is built through the years, aiding the development of the industry through this social capital (section 3.2).

7.3.4. Relevant Organisations in Damietta

The current roles taken by organisations related to furniture industry have been criticised in interviews (section 6.2.3.6) and through certain questions in the survey (section 6.5.4). The Chamber of Woodworking and Furniture Industry (CWWFI) is expected to provide support training and opportunity for marketing and connections to global market to the enterprises in Damietta (CWWFI, 2021). However, this role has not been effectively conveyed or utilised by the majority of the industry community in the city. Interviewees (section 6.2.3.6) highlighted that the support and services provided by CWWFI is targeted to 'certain enterprises' that hold power in the market or aim to make biased profit through their connection to the chamber. This can be argued as targeted social capital with CWWFI which benefits some enterprises over others.

Damietta Furniture City (DFC) has been criticised for its current role in the region and the impact it has on local industry in Damietta (section 6.2.3.6). As it currently stands, it is not welcomed or accepted by the local community in the city and region. Although the project holds huge opportunities for business in the global market, the chances for MSMEs to get involved (through buying units/workshops in DFC) are slim. According to interviews data (section 6.2.3.6), DFC seems to be limited to serving affluent businesses, whereas MSMEs are left out. The approach taken by DFC also provides a duplication of the already existing infrastructure (workshops, factories, transport… etc.) rather than focusing resources on what is currently missing in Damietta's furniture industry (section 6.2.3.6).

The outcomes of the survey related to norms and the relation between MSMEs and relevant organisations in the industry in Damietta scored the least of all social capital measures. This suggests a gap either in services provision from these organisations or in communicating the provided opportunities to enterprises and workers. Addressing these issues are related to SDGs 8, 9, 16 and 17, where the needs lie in bridging the gaps between organisations and the community of enterprises, as well as targeted development of the institutions to effectively service the industry users. Recommendations in section 7.4 below propose solutions and links to be implemented.

7.3.5. Education and The Industry

One of the prevailing obstacles within the industry in Damietta is the disconnection between education and industry (section 6.2.3.4), and the effect of this missing link on design as well as research and development in the craft and industry. Statistical (section 5.3), interviews (section 6.2.3.4) and survey (section 6.5.1) data all show that there is no focus on vocational or industrial training in Damietta, and no links between the educational facilities and industrial enterprises (workshops and/or factories). The ample pattern of passing down the furniture making skillset in Damietta is the vernacular apprenticeship approach (section 6.2.3.3), which functions separate from formal education. This is one of the main barriers in the development of the industry, and an area that would need much input to keep Damietta's economic cluster alive and growing.

Investing in industry-oriented education and training in Damietta would be considered a leap in human capital in the city, and would empower workers and MSMEs owners to advocate for city development with decision makers as they would hold power through their skills and local/global market expertise (Becker, 1993,Johnson, 1960,Schultz, 1961). This missing link also applies to the relationships between organisations like CWWFI and the educational system, where access to trainings and knowledge of how the global market operates is limited to specific individuals in the market (most likely large factories with high

influence and power in the market). Recommendations in section 7.4 below propose solutions for these links.

7.3.6. Methodology Design and Execution

In terms of methodology, the research aims to maximise the use of the proposed tools and minimise their limitations for both qualitative and quantitative inquiries. Interviews were conducted to aid the manifestation of socio-spatial narratives into the argument on social capital in this research. The research attempted to minimise biases during the interviews analysis through crossing the narratives with the thematic analysis (un-biased literature based analysis) (Boje and Rosile, 2002). The interviews also helped inform the selection of the study area through investigating the zones of concentration of different types of workshops and products in the city. The framework (section 4.9.1) and survey (Appendix 6) designs were also tested and validated through the interviews and minor alterations were adopted accordingly in the quantitative tools. It is also important to mention that the interviews established personal contacts within the city (Saunders et al., 2016), which is a vital factor in carrying out the following phase of the research.

The second part of the methodology (quantitative network mapping) was executed through the field survey. The research aimed to minimise statistical errors through confining the survey to a predefined study area (Damietta old city), and through representative sampling of the community of furniture enterprises in the city (Saunders et al., 2016). It is worth mentioning that although the survey sample is statistically representative (sampling in section 4.6.4.1), the research acknowledges that the geospatial network mapping would be enriched with a larger sample. The optimum method of acquiring a comprehensive geospatial dataset of all connections in the network would be through big data approach (not an available option in this context for various limitations including accessibility, data availability, willingness to participate, and other). Therefore,

the research deals with the limitations of data availability and acknowledges the need to abide by a statistical sample for this study.

7.3.7. Research Outputs

The outputs of this work provide a comprehensive account of the qualitative dynamics (section 6.2) as well as quantified spatial mapping of social capital (sections 6.3, 6.4, 6.5 and 6.6) in Damietta's furniture industry. The analysis of the supply chain (sections 6.2.3.1 and 6.5.2) offered an understanding of the process through which social actions occur among actors (enterprise owners), resulting in three patterns of production processes identified (Enterprise sequential, Product order-based and Inhouse) as illustrated in section 6.2.5. The thematic interviews analysis (section 6.2.3.3) revealed a high emphasis on trust between business collaborators, and the importance of history of transactions for future business dealings. All interviewees stressed that their preference in selecting their networks relate to either personal trust or the referral from a trusted intermediary. The concept of intermediaries (section 6.2.5) is also another vital aspect that was exhibited in the furniture industry context in Damietta. Almost all business owners have a double role of acting as intermediaries for other businesses on different levels of the supply chain. For example, supportive industries such as glue factories act as intermediaries for business owners in the manufacturing and the assembly stages, since their business deals with both simultaneously, which circles back to the significance of referral and trusted word.

The spatial network mapping (section 6.6) revealed agglomerations in certain areas of the city according to activity, type or product, as well as a variety of patterns of connections between enterprises that work as separate production lines (cluster analysis in section 6.6.2.2) within the city. Investigation of kinship also provided evidence of the correlation between social capital and familial relations in Damietta (section 6.6.1.8). The qualitative and quantitative data together provide a comprehensive evidence on the abundance of social capital

in Damietta and signify the vital role of social capital networks in the success of Damietta as a regional furniture hub.

7.4. Concluded Recommendations

The research managed to address the original hypothesis and research question (further in section 7.3.1); where **the abundance and major role of social capital agglomeration in the economic cluster of Damietta has been proven and supported with primary data (quantitative and qualitative)**. The research aim (section 1.2) has also been fulfilled with the designed methodology (section 7.3.6). A validated tool for measuring and mapping social capital and spatial interactions in the city has been successfully developed, tested and utilised to create the dataset for Damietta (theoretical framework in section 4.9.1). The connection between spatial distribution and social capital has been mapped and analysed as a result of this tool (sections 6.6.2 and 7.3.3).

Regarding the research objectives (section 1.3), each has been tackled and achieved through the different parts of the designed methodology. To be more specific, documentation and investigation of the industry supply chain (objective 1) has been accomplished through examination of the literature (Chapter 2 and Chapter 3) as well as semi-structured interviews (section 6.2) followed by an overlay of these two tools in an analytical account (section 7.3). The theoretical framework and spatial mapping tool (objective 2) (section 4.9) has been developed through literature (Chapter 2 and Chapter 3) and context investigation (Chapter 5), and validated through interviews. This framework was then developed into a survey (section 4.6.4.2) that was translated into geospatially mapping of social capital networks in Damietta (section 6.6) (objective 3). Lastly, all the previously mentioned data and analysis was collated to be the basis of recommendations proposed by the researcher for different stakeholders in the industry in Damietta (objective 4), which are mentioned in this section below.

The findings (Chapter 6) exhibit evidence of the vitality of trust, networks and norms (sections 6.2.3.3 and 6.5) as a main structure of business interactions between MSMEs in the city. The spatially dense urban fabric of the city also showed links between proximity and social capital (sections 6.6.2.1 and 7.3.3). The network mapping succeeded in identifying the spatial clusters of different types of workshops and the connections between them (through nodes and ties) (section 6.6.2.2). The representative sample (section 4.6.4.1) used in this research offers the potential for generalisation to the population of furniture industry MSMEs in Damietta (Saunders et al., 2016). This adds to a similar potential to appropriate the research approach and theoretical framework to other contexts. The potential lies in the common factors between global south cities with local industry concentrations, small-scale (MSME-based) economic clusters, and a strong long-term social structure. Through context examination and consideration, the research methodology can be replicated in different contexts for comparable industries (external validity of this research is justified in section 4.5.1).

The input and interactions between different stakeholders in Damietta form the intertwined case of the furniture industry's influence on the identity, socio-economic pattern of living and urban dynamics of the city (urban patterns examined in section 6.2.4). Understanding the consequences of the findings of this research on each of these stakeholders and the interlinks between actors was the basis of the proposed urban, economic and social recommendations stated below. These recommendations aim to inform the sustainable development of the whole socioeconomic ecosystem in Damietta in an inclusive and coherent scheme with focus on the existing asset of social capital between MSMEs in furniture industry.

The stakeholders considered in this research are:

- Decision makers.

- City Planners.
- Local Enterprises (MSMEs).
- CWWFI (Chamber of Woodworking and Furniture Industry) in Damietta.
- DFC (Damietta Furniture City) Project Management.

The following is a list of recommendations for each stakeholder group according to the research findings. Each stakeholder group is further discussed in the sections to follow.

Table 7-1 - Recommendations for development for different stakeholders in Damietta (source: researcher analysis and conclusions)

Stakeholders	Recommendations	Relevant Sections in Results & Discussion	Targeted SDGs
Decision makers • City Municipality (Governor of Damietta) • Information and Decision Support Centre • Media Centres • Cultural Centres	Prioritising local enterprises (MSMEs)	Sections 6.2.3.4 – 6.2.3.6 – 7.3.4	8, 9, 11
	Providing top industrial education with focus on furniture-making	Sections 6.2.3.4 – 7.3.5	4, 9
	Review and update policies governing furniture industry market	Sections 6.2.3.3 – 6.2.3.4	9, 12, 16
City Planners	Review the spatial distribution of the city's furniture industry in future development areas in Damietta	Sections 6.2.3.5 – 6.4 – 6.6.2 – 7.3.3	9, 11
	Capitalise on existing paths and urban connections that serve linking commodities in furniture industry	Sections 6.2.3.5 – 6.4 – 6.5.2 – 6.6.2 – 7.3.3	9, 11, 12
	Apply participatory planning where residents and MSMEs can take part in the planning process	Sections 6.2.3.4 – 6.2.3.6	11, 17
Local Enterprises	Connect to other stakeholders and decision makers for developing skills and finding opportunities		8, 9, 17
	Follow CWWFI for available trainings and skills development activities	Sections 6.2.3.6 – 7.3.4	4, 8, 9
	Take initiative to connect to global market and find out global market needs (possible connection to DFC)		9, 12, 17
	Take initiative to further train and educate workers to enhance their skillset in the industry	Sections 6.2.3.4 – 7.3.5	4, 8, 9
	Take initiative to register all workers and incentivise them through social security legal status	Sections 6.2.3.4	8, 12
CWWFI (Chamber of Woodworking and Furniture Industry)	Provide platform for partnerships between enterprises on different levels	Sections 6.2.3.6 – 7.3.4	5, 8, 9, 12, 16, 17
	Provide training for professionals to enhance skills in the market	Sections 6.2.3.4 – 7.3.5	4, 8, 9
	Provide funding opportunities for MSMEs to develop business and skills, and to expand in the market	Sections 6.2.3.6 – 7.3.4	9, 12, 16, 17
DFC (Damietta Furniture City)	Provide a logistic link between the local market and the global	Sections 6.2.3.6 – 7.3.4	16, 17
	Connect to local MSMEs in Damietta and reach out to the scale and pattern of work adopted in the city	Sections 6.2.3.6 – 6.5.2 – 7.3.2 – 7.3.4	8, 9, 11, 12
	Limit duplication of existing enterprise structures in new workshops – such efforts can be redirected towards the logistic role of DFC in the global market	Sections 6.2.3.6 – 6.2.3.5 – 6.4 – 6.6.2 – 7.3.3 – 7.3.4	11, 12, 16, 17

7.4.1. Decision makers

To link the research findings to decision-making and development in Damietta, it was vital to first identify the decision-making bodies in the context (stated in Table 7-2 below) and the focus of each body in relation to the furniture industry in the city. The main decision-making authority in Damietta is the City Municipality led by the Governor of Damietta through the Government General Office, which comprises services such as public relations and media departments, as well as a branch of the National Information and Decision Support Center (main branch in Cairo) (Damietta Governorate, 2020). The latter is specifically significant as it works within a bigger umbrella that influences development approaches in Egypt within various fields (IDSC, 2021). Other public services that can benefit development in the furniture industry in Damietta include the Media and Cultural Centres in Damietta city, which both have a vital role in community awareness and cultural activities.

After Identifying the key decision makers, the following recommendations have been put forth based on the data analysis (Chapter 6) and discussion (section 7.3) above.

Prioritise support to local enterprises. This would be the first and foremost recommendation for all the decision makers mentioned earlier. The role of each differs according to their line of work.

Providing top industrial education with focus on furniture-making. The craft in Damietta is usually passed on through generations and local contacts. However, proper industrial education is not provided to residents who might not have access to these contacts (section 7.3.5). In a context where furniture industry is part of the identity of the city, the authorities and government are urged to give special focus to industrial education that corresponds to the current technologies in furniture industry in the global market, with priority to Damietta's

residents. This not only creates an industrial education hub in the city but ensures the continuation of the industry's excellence in generations to follow.

Review and update policies governing furniture industry market. The current policies for the furniture industry in Damietta are the same as the general trade and industry guides in Egypt, which does not take into consideration the specific pattern of work-live relationship within Damietta's community (section 6.2.4). Updated policies that address the complexities relevant to the furniture industry in Damietta are needed for efficient development of the craft in the city.

Table 7-2 - Public services in Damietta Governorate (Source: *Damietta Governorate, 2020*)

Governing Entity	Service	Relevance to Furniture Industry
Governorate General Office	Switch (Telephony)	
	Public Relations Department	Yes
	Media Department	Yes
	Information and Decision Support Center	Yes
	Computer Science Training Centre	
	Administrative Training Center	
	The crisis room	
	Tourism and Vacation Destinations Administration	
	Youth graduate employment system	
Damietta City	Media Centre	Yes
	Cultural Centre	Yes
	First police station	
	A second police station	
	Fire truck	
	Ambulance	
	Mobile	
	The Gas Distribution Centre	
	Natural Gas Company	
	Postal Authority	
	Phones and malfunctions	
	Drinking water company	
	Electricity Company	
	Electricity Management	
	Bus station	
	Railway station	

7.4.2. City Planners

Review the spatial distribution of the city's furniture industry in future development areas in Damietta. The spatial distribution of Damietta city and the interlinked locations of furniture industry MSMEs formulate a significant portion of the success of the industry in this particular setting (sections 6.4 and

6.6.2). For this reason, tackling city planning in a way that responds to the complexities of the city is quite important.

Capitalise on existing paths and urban connections that serve linking commodities in furniture industry. The existing distribution of enterprises and infrastructure (sections 6.4 and 6.6.2) has proven quite successful in a rather vernacular pattern of spaces, hence spatially capitalising on the existing patterns would ensure the continuation of the successful and community-led socioeconomic activities.

Apply participatory planning where residents and MSMEs can take part in the planning process. Residents in Damietta are more than just space users of the city but rather form an industrial sector that generates the city's main source of income, the furniture industry (sections 6.2.3.1, 6.2.3.5 and 6.6.2). This would imply that they should be involved in the planning process to ensure the socioeconomic needs of the residents/enterprise owners are met by planners.

7.4.3. Local Enterprises

Connect to other stakeholders and decision makers for developing skills and finding opportunities. The social network in Damietta's furniture industry is highly connected within the same level enterprises, however, there is a lack of connectivity between the hierarchical levels of businesses in the market (sections 6.5.5, 6.6.2 and 7.3.1). This implies that active effort to connect is needed from local enterprises on the various levels in the market, and this includes enterprises in other parts of Damietta governorate as well.

Follow CWWFI for available trainings and skills development activities. Results show that most enterprises are quite detached from CWWFI (sections 6.5.4 and 7.3.4) and any activities or news that are generating through it. CWWFI is an entity that should provide support to local enterprises in the furniture

industry (CWWFI, 2021), and capitalising on this asset is highly recommended to local enterprises.

Take initiative to connect to global market and find out global market needs (possible connection to DFC). Results show that MSMEs in Damietta are highly local in businesses and rarely deal with global market (sections, 5.4, 6.2.3.4, 6.2.3.6 and 7.3.4). Utilising connections such as DFC and working on connecting to the global market is a highly needed aspect in the current situation in Damietta.

Take initiative to further train and educate workers to enhance their skillset in the industry. Skills are transferred through contacts and informal apprenticeship, which maintains the baseline for the skills in Damietta (sections 5.3, 6.2.3.4 and 7.3.5). However, new skills and technologies that would match the global market are missing since they require external education and skillset enhancement (section 6.2.3.2). Enterprise owners are encouraged to provide further training to their workers in order to meet the global market skillset.

Take initiative to register all workers and incentivise them through social security legal status. The unstable job market for junior workers in Damietta highly related to the missing legality and social security status (section 5.4.2). Incentivising workers through proper paperwork processing and registration would ensure their continued employment and hence push their motivation to enhance the business, products and their own skillset towards the success of the business.

7.4.4. Chamber of Woodworking and Furniture Industry (CWWFI)

Provide platform for partnerships between enterprises on different levels. The role of CWWFI as a catalyst for the development of the industry and a linking body between stakeholders needs to be clearer to MSMEs and residents in Damietta (section 6.2.3.6). CWWFI has an opportunity to capitalise on this

through creating a platform for collaboration between different stakeholders, maximising possible expansions and developments in the industry in Damietta.

Provide training for professionals to enhance skills in the market. CWWFI also has an educational role in a more awareness and advocacy-sided capacity (CWWFI, 2021). Workshops and trainings for enterprise owners and workers in the industry (section 7.3.5) would be beneficial as well as would help solidify the platform approach within the industry community in the city. This educational approach would also help bridge the gaps that currently exist in the industry supply chain patterns in Damietta (section 6.2.3.1).

Provide funding opportunities for MSMEs to develop business and skills, and to expand in the market. CWWFI has the connection with other public and governmental bodies that provide funding for development and utilising these connections to provide support for furniture MSMEs in Damietta is a link highly needed in the city (sections 6.2.3.4 and 6.2.3.6).

7.4.5. DFC (Damietta Furniture City) Project Management

Provide a logistic link between the local market and the global. The current structure of DFC focuses of creating new infrastructure, which is a duplication of the existing infrastructure in Damietta city (sections 6.2.3.6, 6.5.4 and 7.3.4), however, this doesn't have to be the case. The local industry is in dire need of a strong logistic connection to the global market, and DFC has the capability to take on this role (section 7.3.4).

Connect to local MSMEs in Damietta and reach out to the scale and pattern of work adopted in the city. In order to provide the missing link needed in the local industry to the global market (section 7.3.4), DFC needs to connect to the existing community of furniture industry enterprises and work side-by-side. With global outreach by DFC and local expertise from MSMEs, a comprehensive

approach that benefits all parts and elevates the city's economy as a hub for furniture industry nationally and regionally can be achieved.

Limit duplication of existing enterprise structures in new workshops – such efforts can be redirected towards the logistic role of DFC in the global market. Understanding the duplication of infrastructure that is currently taking place in DFC (sections 6.2.3.6, 6.5.4 and 7.3.4), and relocating resources into a linking role (such as global events, partnerships generation and export services) can lead to drastic improvement in the furniture industry as well as the success of DFC project in the region.

7.5.   Further Research

For the sake of this particular study, the scale and scope of the work has been limited to the amount of time and resources of a doctoral thesis. That said, the adopted approach and methodologies have potential to contribute to various directions and scales of research, and to provide more data and impact than the scope visited in this thesis. The first step of future research has already been taken forward, as this work has already been developed into an **AHRC-funded project (£150k in 2020)**. This project investigated social capital networks in Damietta region (rather than the limitation of the case study area in this research) in light of the threat of climate emergency and conservation of these networks as part of the city's culture and identity (CHERISH). This project investigated the concept visited in the thesis on a **wider geographic implementation**, as well as put more emphasis on the resilience (or lack thereof) of the different types of urban economies (grassroots vs mega development) in the region to the **risk of sea level rise** (also highlighted in section 1.5.5).

Relating to the notion of regional scope for social capital networks, other possible further research could incorporate the investigation of social capital for other urban economic bases in the region, where the dynamics of **agriculture** -as another major economic base in the Nile Delta- (El-Raey, 1997) plays a large

role in the economic stability of Damietta and the surrounding towns and villages. This would also relate to investigating a variety of geospatial aspects of the networks that have not been identified in the scope of this thesis, such as **land use vs land cover patterns for industry- and agriculture-led settlements in Damietta**. This can also include investigating connections between the **networks for industry and agriculture, and their supply chain overlaps and complementarities**.

Similarly, different industries could be investigated within the Egyptian context (such as textile industry in Mahalla city, and agricultural products in the west desert Oases). **The theoretical and spatial framework can be appropriated to investigate the different patterns of work and supply chain for different industries** as related to the spatial patterns and the livelihoods of the community in each case study. This would allow for creating a larger dataset that would inform industrial development on a national scale in Egypt through multiple acupuncture-like contextual development solutions.

This latter idea also unlocks other approaches that relate to **influencing policies and institutional support for industries in Egypt**. This has been touched upon within this thesis in Damietta data investigation (Chapter 5) and within the data collection methodologies (Chapter 4). Building on this base towards informing decision making and policies for local authorities, national guidelines and market-led NGOs and institutions in Egypt would provide a novel contribution to the industry networks and stakeholders through a top-down approach.

Another angle that was touched upon in this thesis is **the effect of climate change on Damietta city and region**, and the vulnerability and resilience of the furniture industry networks to it (section 1.5.5). This can be the base of further research, where geolocation mapping of the networks can be overlapped with IPCC scenarios for sea level rise for Damietta (El-Raey, 2010,IPCC, 2014). This

approach would result in formulating an approach for climate emergency-oriented development in Damietta.

Empirical additional research that can also be taken forward on the back of this research is building up a comprehensive **urban data repository for furniture industry in Damietta**. This could be achieved by utilising big data approach to crowdsource information (rather than the traditional on-ground survey). This would offer a more informed profile of social capital networks in Damietta based on total population, with no restriction of sample size.

Further investigation of the comparison between the vernacular social capital networks in Damietta and the technology of blockchain (section 7.3.3) would also be an interesting concept to explore, and would contribute to a different target stakeholder group in the city and region. This research would significantly relate to the vocational education system and the effect of the technological breakthroughs in the industry on this system. Possible explorations would include product design as a new approach, as well as new equipment and tools that require different skillsets than the traditional craft-based approach currently adopted in Damietta. This investigation would highlight the connections, variations and opportunities for development would arise through this overview of old vs new education and skills profile based on technology.

The outlined further research approaches above also emphasise the long-term contribution of this research to knowledge, where future investigations can be built on the back of this doctoral thesis. This has also started with the AHRC-fund presented above, and would possibly continue in future projects and funding.

REFERENCES

AlShayal, Gamal Eldin. 2000. "A Comprehensive History of Damietta."

Arai, Yoshio, Hiroyuki Nakamura, Hideto Sato, Takashi Nakazawa, Tadahiko Musha, and Kazuhiro Sugizaki. 2004. "Multimedia and Internet Business Clusters in Central Tokyo." *Urban Geography* 25(5):483–500. doi: 10.2747/0272-3638.25.5.483.

Arrow, K. J. 1962. "The Economic Implications of Learning by Doing." *Review of Economic Studies* 29(3):155–73.

Banholzer, Sandra, James Kossin, and Simon Donner. 2014. "Reducing Disaster: Early Warning Systems For Climate Change." Pp. 21–50 in, edited by Z. Zommers and A. Singh.

Barney, J. 1991. "Firm Resources and Sustained Competitive Advantage." *Journal of Management* 17(1):99–120.

Bassett, Keith, Ron Griffiths, and Ian Smith. 2002. "Cultural Industries, Cultural Clusters and the City: The Example of Natural History Film-Making in Bristol." *Geoforum* 33(2):165–77. doi: 10.1016/S0016-7185(01)00032-X.

Bathelt, H., A. Malmberg, and P. Maskell. 2004. "Clusters and Knowledge: Local Buzz, Global Pipelines and the Process of Knowledge Creation." *Progress in Human Geography* 28(1):31–56.

Becker, Gary S. 1993. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. 3rd ed. Chicago and London: The University of Chicago Press.

Bhaskar, Roy. 2010. "Reclaiming Reality: A Critical Introduction to Contemporary Philosophy." *Reclaiming Reality: A Critical Introduction to Contemporary Philosophy* 1–175.

Bianchini, Franco, and Michael Parkinson. 1993. *Cultural Policy and Urban Regeneration : The West European Experience*. Manchester University Press.

Boje, David M., and Grace Ann Rosile. 2002. "Enron Whodunit?" *Ephemera* 2(4):315–27.

Bourdieu, Pierre. 1986. "The Forms of Capital." Pp. 280–91 in *Handbook of theory and research for the sociology of education*, edited by N. W. Biggart. London: Greenwood Press.

Bourdieu, Pierre, and Jean Claude. Passeron. 1990. *Reproduction in Education, Society and Culture*. 2nd ed. London: Sage.

Boxman, Ed A. W., Paul M. De Graaf, and Hendrik D. Flap. 1991. "The Impact of Social and Human Capital on Cooperative Behaviour." *Social Networks* 13(1991):51–73.

Brewer, Anthony. 1984. *A Guide to Marx's Capital*. Cambridge University Press.

Burrell, Gibson, and Gareth Morgan. 1979. *Sociological Paradigms and Organisational Analysis - Elements of the Sociology of Corporate Life*.

Burt, Ronald S. 1992. *Structural Holes: The Social Structure of Competition*. Vol. 111. Harvard University Press.

Burt, Ronald S. 1997. "The Contingent Value of Social Capital." *Quarterly* 42(2):339–65.

Burt, Ronald S. 2000. "The Network Structure Of Social Capital." *Research in Organizational Behavior* 22:345–423. doi: 10.1016/s0191-3085(00)22009-1.

Burt, Ronald S. 2001. "Structural Holes Versus Network Closure As Social Capital." Pp. 31–56 in *Social capital: Theory and research*, edited by R.

Dubos. New York.

Burt, Ronald S. 2015. "Reinforced Structural Holes." *Social Networks* 43:149–61. doi: 10.1016/j.socnet.2015.04.008.

Calenge, Pierric. 2002. "The Music Industry in France: Economic Geography of a Changing Sector." *La Revue Des Musiques Populaires* 1(2):101–18. doi: 10.4000/volume.2454.

CAMPAS. 2017. *Statistics of Egypt; Population Estimates 2017*.

Campbell, Karen E., Peter V. Marsden, and Jeanne S. Hurlbert. 1986. "Social Resources and Socioeconomic Status." *Social Networks* 8(1):97–117. doi: 10.1016/S0378-8733(86)80017-X.

CAPMAS. 2019a. *Egypt Statistical Yearbook 2019 (Census)*. Cairo, Egypt, Egypt.

CAPMAS. 2019b. "GIS Data from Census Data 2017."

CAPMAS. 2019c. *Statistical Census Data 2017*.

Climate Central. 2018. "Surging Seas; Risk Zone Map." Retrieved February 1, 2018 (https://ss2.climatecentral.org/#14/31.1757/29.8937?show=satellite&projections=0-K14_RCP85-SLR&level=6&unit=feet&pois=hide).

Cole, Richard L. 1973. "Toward as Model of Political Trust : A Causal Analysis." *American Journal of Political Science* 17(4):809–17.

Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *The Americal Journal of Sociology* 94(1988):S95–120. doi: 10.1037/0012-1649.22.6.723.

Coleman, James S. 1990. *Foundations of Social Theory*. Harvard University Press.

Corley, Kevin G., and Dennis A. Gioia. 2011. "Building Theory about Theory Building: What Constitutes a Theoretical Contribution?" *Https://Doi.Org/10.5465/Amr.2009.0486* 36(1):12–32. doi: 10.5465/AMR.2009.0486.

Creswell, John W., and Cheryl N. Poth. 2018. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. London: Sage Publications Ltd.

Creswell, John W., and Vicki L. Plano Clark. 2017. *Designing and Conducting Mixed Methods Research*. Los Angeles: SAGE.

Curtis, Fred. 2003. "Eco-Localism and Sustainability." *Ecological Economics* 46(1):83–102. doi: 10.1016/S0921-8009(03)00102-2.

CWWFI. 2021. "Chamber of Woodworking and Furniture Industry CWWFI." Retrieved August 22, 2021 (https://www.cwwfi.com/2021/).

Damietta Governorate. 2020. "Damietta Governorate - Public Services List."

Dasgupta, Susmita, Benoit Laplante, Craig Meisner, David Wheeler, and Jianping Yan. 2009. "The Impact of Sea Level Rise on Developing Countries: A Comparative Analysis." *Climatic Change* 93(3–4):379–88. doi: 10.1007/s10584-008-9499-5.

Deutsch, Morton. 1958. "Trust and Suspicion." *Journal of Conflict Resolution* 2(4):265–79. doi: 10.1177/002200275800200401.

Dictionary. 2021. "Dictionary.Com | Meanings and Definitions of Words at Dictionary.Com." Retrieved August 17, 2021 (https://www.dictionary.com/).

Dissaux, Tristan, and William O. Ruddick. 2017. "Challenges of Collective Organization and Institution Building around Community Currencies in Kenyan Slums." Pp. 1–9 in *IV International Conference, Social and Complementary Currencies*. Barcelona, Spain.

Dunn, John. 1984. "The Concept of Trust in the Politics of John Locke." Pp. 279–301 in *Philosophy in History: Essays on the Historiography in Philosophy*, edited by Richard Rorty, J. B. Schneewind, and Quentin Skinner. Cambridge University Press.

Ehrlich, P. R., and J. P. Holdren. 1971. "Impact of Population Growth." *Science* 171(3977):1212–17. doi: 10.1126/science.171.3977.1212.

El-Gammal, Maie I., Rafat R. Ali, and Rasha Eissa. 2014. "Land Use Assessment of Barren Areas in Damietta Governorate, Egypt Using Remote Sensing." *Egyptian Journal of Basic and Applied Sciences* 1(3–4):151–60. doi: 10.1016/j.ejbas.2014.07.002.

El-Raey, Mohamed. 1997. "Vulnerability Assessment of the Coastal Zone of the Nile Delta of Egypt, to the Impacts of Sea Level Rise." *Ocean & Coastal Manaoement* 37(1):29–40. doi: 10.1016/S0964-5691(97)00056-2.

El-Raey, Mohamed. 2010. "Impact of Sea Level Rise on the Arab Region." *Transport* 1–89.

Elshamy, Hany M. 2015. "Measuring the Informal Economy in Egypt." *International Journal of Business Management and Economic Research(IJBMER)* 6(2):137–42.

Flap, Hendrik Derk, and Beate Völker. 2004. "Creation and Returns of Social Capital." 20–35. doi: 10.4324/9780203643648-11.

Fox, Alan. 1974. "Beyond Contract : Work, Power and Trust Relations."

Friedman, James W. 1983. *Oligopoly Theory*. London: Cambridge University Press.

Gibson-Graham, J. K. 2006. *The End of Capitalism (As We Knew It)*.

Gillham, Bill. 2005. *Research Interviewing : The Range of Techniques*. Open University Press.

Gittell, Ross J., and Avis Vidal. 1998. "Social Capital and Networks in Community Development; Framing the LISC Demonstration." Pp. 13–32 in *Community Organizing: Building Social Capital as a Development Strategy*. Sage Publications Ltd.

De Graaf, N. D., and H. D. Flap. 1988. "'With a Little Help from My Friends': Social Resources as an Explanation of Occupational Status and Income in West Germany, The Netherlands, and the United States." *Social Forces* 67(2):452–472.

Granovetter, Mark. 1985. "Economic Action and Social Structure : The Problem of Embeddedness." *The American Journal of Sociology* 91(3):481–510.

Granovetter, Mark S. 1973. "The Strength of Weak Ties." *The American Journal OfSociology* 78(6):1360–80. doi: 10.4135/9781412958479.n556.

Hauberer, Julia. 2011. *Social Capital Theory; Towards a Methodological Foundation*.

Hirst, Paul, and Jonathan Zeitlin. 1991. "Flexible Specialization versus Post-Fordism: Theory, Evidence, and Policy Implications." *Economy and Society* 20(1). doi: 10.4324/9780203995549.

Horodnic, Ioana A., Peter Rodgers, Colin C. Williams, and Legha Momtazian. 2018. *The Informal Economy : Exploring Drivers and Practices*. edited by I. A. Horodnic, P. Rodgers, C. C. Williams, and L. Momtazian. Taylor & Francis.

Hunt, Carter A., William H. Durham, and Claire M. Menke. 2015. "Social Capital in Development: Bonds, Bridges, and Links in Osa and Golfito, Costa Rica." *Human Organization* 74(3):217–29. doi: 10.17730/0018-7259-74.3.217.

IDSC. 2021. "National Information and Decision Support Center Website (IDSC)." Retrieved (https://www.idsc.gov.eg/IDSC/Default.aspx).

ILO. 2013. "Measurement of the Informal Economy." *The Informal Economy and Decent Work: A Policy Resource Guide* 8.

ILO. 2016. *Skills for Trade and Economic Diversification (STED) in Egypt; The Case of the Furniture Industry*. Cairo.

International Labour Organization. 2013. *Measuring Informality: A Statistical Manual on the Informal Sector and Informal Employment*.

International Labour Organization. 2016. *Skills for Trade and Economic Diversification (STED) in Egypt; The Case of the Furniture Industry (Arabic Version)*. Cairo.

International Labour Organization (ILO). 1993. "Guidelines Concerning a Statistical Definition of Informal Employment." *The Seventeenth International Conference of Labour Statisticians (ICLS)*.

IPCC. 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability; Part B: Regional Aspects; Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. edited by V. R. Barros, C. B. Field, D. J. Dokken, M. D. Mastrandrea, K. J. Mach, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, and L. L. White.

Isaksen, Arne. 1997. "Regional Clusters and Competitiveness: The Norwegian Case." *European Planning Studies* 5(1):65–76. doi: 10.1080/09654319708720384.

Johnson, Harry G. 1960. "The Political Economy of Opulence." *The Canadian*

Journal of Economics and Political Science 26(4):552–64.

Jong-sung You. 2012. "Social Trust: Fairness Matters More Than Homogeneity." *Political Psychology* 33(5):701–21. doi: 10.1111/j.

Koivumäki, Jaakko. 2013. "Measuring the Social Capital of Professions: A Study of Dentists in Finland." *International Journal of Sociology and Social Policy* 33(7/8):491–508. doi: 10.1108/EL-01-2017-0019.

Krätke, Stefan. 2002. "Network Analysis of Production Clusters: The Potsdam/Babelsberg Film Industry as an Example." *European Planning Studies* 10(1):27–54. doi: 10.1080/09654310120099254.

Lin, Nan. 2001. "Building a Network Theory of Social Capital." in *Social capital: Theory and research*, edited by R. Dubos. New York.

Lin, Nan. 2003. "Social Capital: A Theory of Social Structure and Action." *Structural Analysis in the Social Sciences* 293.

Lin, Nan, and Yanjie Bian. 1991. "Getting Ahead in Urban China." *Https://Doi.Org/10.1086/229816* 97(3):657–88. doi: 10.1086/229816.

Lin, Nan, and Mary Dumin. 1986. "Access to Occupations through Social Ties." *Social Networks* 8(4):365–85. doi: 10.1016/0378-8733(86)90003-1.

Lin, Nan, Walter M. Ensel, and John C. Vaughn. 1981. "Social Resources and Strength of Ties: Structural Factors in Occupational Status Attainment." *Source* 46(4):393–405.

Luhmann, Niklas. 1979. "Trust and Power."

Van Maanen, John, Jesper B. Sørensen, and Terence R. Mitchell. 2007. "The Interplay between Theory and Method." *Academy of Management Review* 32(4):1145–54. doi: 10.5465/AMR.2007.26586080.

Magretta, Joan. 2012. *Understanding Michael Porter; The Essential Guide to Competition and Strategy*. Boston, Massachusetts: Harvard Business Review Press.

Marsden, Peter V., and Jeanne S. Hurlbert. 1988. "Social Resources and Mobility Outcomes: A Replication and Extension." *Social Forces* 66(4):1038–59. doi: 10.1093/SF/66.4.1038.

Marshall, A. 1890. *Principles OfEconomics: An Introductory Volume*. London: Macmillan.

Marx, Karl. 1999. *Capital: A New Abridgement*. edited by D. McLellan. Oxford University Press.

Mengliev, Andrey. 2015. "Current and Future Challenges of the Ceramic Tile Firms." Universitat Jaume.

Min, Hokey. 2019. "Blockchain Technology for Enhancing Supply Chain Resilience." *Business Horizons* 62(1):35–45. doi: 10.1016/j.bushor.2018.08.012.

Misztal, Barbara A. 1996. "Trust in Modern Societies : The Search For The Bases of Social Order."

Mohajan, Haradhan. 2019. "The First Industrial Revolution: Creation of a New Global Human Era." *Journal of Social Sciences and Humanities* 5(4):377–87.

Mohamed Elgali, Samir Hosny, Zaki Elkadi, and Mohsen Elbadawy. 2019. "President Launches Damietta Furniture City." *ElYom ElSabee*.

Moore, Gemma, Ben Croxford, Mags Adams, Mohamed Refaee, Trevor Cox, and Steve Sharples. 2008. "The Photo-Survey Research Method: Capturing Life in the City." *Visual Studies* 23(1):50–62. doi: 10.1080/14725860801908536.

Nachmias, David. 1985. "Determinants of Trust within the Federal Bureaucracy." in *Public Personnel Policy: The Politics of Civil Service*, edited by D. H. Rosenbloom. New York: Associated Faculty Press.

Naughton, Linda. 2014. "Geographical Narratives of Social Capital: Telling Different Stories about the Socio-Economy with Context, Space, Place, Power and Agency." *Progress in Human Geography* 38(1):3–21. doi: 10.1177/0309132513488731.

Newman, Peter, and Ian Smith. 2000. "Cultural Production: Place and Politics on the South Bank of the Thames." *International Journal of Urban and Regional Research* 24(1):9–24. doi: 10.1111/1468-2427.00233.

Öberg, Perola, Sven Oskarsson, and Torsten Svensson. 2011. "Similarity vs. Homogeneity: Contextual Effects in Explaining Trust." *European Political Science Review* 3(3):345–69. doi: 10.1017/S1755773910000354.

Ochiai, Hitoshi. 2015. "The Coleman Boat and the Macro-Micro Link." *Riron to Hoho / Sociological Theory and Methods* (May 2015).

Patel, Bhavesh M., and U. Rao Cherukuri. 2002. "NVA: A Value Addition Measure For Capital Project Evaluation." *Journal of Applied Business Research (JABR)* 18(4). doi: 10.19030/JABR.V18I4.2129.

Pini, Martina, Anna Maria Ferrari, Rita Gamberini, Paolo Neri, and Bianca Rimini. 2014. "Life Cycle Assessment of a Large, Thin Ceramic Tile with Advantageous Technological Properties." *International Journal of Life Cycle Assessment* 19(9):1567–80. doi: 10.1007/s11367-014-0764-8.

Podolny, Joel M. 2019. "A Status-Based Model of Market Competition Author (s): Joel M . Podolny Source : American Journal of Sociology , Vol . 98 , No . 4 (Jan ., 1993), Pp . 829-872 Published by : The University of Chicago Press Stable URL : Https://Www.Jstor.Org/Stable/278." 98(4):829–72.

Porter, ME. 2008. "The Five Competitive Forces That Shape Strategy." *Harvard Business Review* 86(1):78–93, 137. doi: Article.

Porter, Michael E. 1985. *Competitive Advantage; Creating and Sustaining Superior Performance*. New York.

Porter, Michael E. 1990. "The Competitive Advantage of Nations." *Harvard Business Review*. doi: 10.1007/978-1-349-11336-1.

Porter, Michael E. 2012. "Strategy and the New Competitive Advantage: Creating Shared Value." *Harvard Business Review*.

Portes, Alejandro, and Julia Sensenbrenner. 1993. "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action." *Https://Doi.Org/10.1086/230191* 98(6):1320–50. doi: 10.1086/230191.

Putnam, Robert D. 2002a. *Bowling Alone : The Collapse and Revival of American Community*. Simon & Schuster.

Putnam, Robert D. 2002b. *Bowling Alone: America's Declining Social Capital*. Simon & Schuster.

Putnam, Robert D., Robert Leonardi, Raffaella Y. Nonetti, Raffaella. Nanetti, Raffaella Y. Nonetti, and Raffaella. Nanetti. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.

Qiu, Xinlu, Marcelo Cano-Kollmann, and Ram Mudambi. 2017. "Competitiveness and Connectivity in Design Innovation: A Study of Norwegian Furniture Industry." *Competitiveness Review* 27(5):533–48. doi: 10.1108/CR-03-2017-0025.

Reed, M. 2005. "Reflections on the 'Realist Turn' in Organization and Management Studies." *Journal of Management Studies* 42(8):1621–44. doi: 10.1111/j.1467-6486.2005.00559.x.

Restrepo-Echavarria, Paulina. 2011. "Macroeconomic Volatility: The Role of the Informal Economy." *European Economic Review* 70:454–69. doi: 10.1016/j.euroecorev.2014.06.012.

Romer, P. M. 1994. "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94(5):1002–37.

Rosenthal, Terese, and Ernst Rauch. 2013. "2012 Natural Catastrophe."

Roy, Delwin A. 1992. "The Hidden Economy in Egypt." *Middle Eastern Studies* 28(4):689–711. doi: 10.1080/00263209208700925.

Ruddick, William O. 2015. "Trust and Spending of Community Currencies in Kenya." P. 22 in *3 rd International Conference on Social and Complementary Currencies Oct 27th-30th 2015 Management School at Federal University of Bahia - Salvador, Brazil*.

Ruddick, William O., Morgan A. Richards, and Jem Bendell. 2015. "Complementary Currencies For Sustainable Development in Kenya: The Case of The Bangla-Pesa." *International Journal of Community Currency Research* 19(D):18–30.

Ruzek, William. 2015. "The Informal Economy as a Catalyst for Sustainability." *Sustainability (Switzerland)* 7(1):23–34. doi: 10.3390/su7010023.

Sahlins, Marshall. 1972. *Stone Age Economics*. Chicago and New York: Aldine Atherton Inc.

Saunders, Mark N. K., Philip Lewis, and Adrian Thornhill. 2016. *Research Methods for Business Students*. Seventh. Pearson Education Limited.

Schultz, Theodore W. 1961. "Investment in Human Capital." *The American Economic Review* 51(1):1–17.

Scott, Allen J. 1997. "The Cultural Economy of Cities." *International Journal of Urban and Regional Research* 21(2):323–39. doi: 10.1111/1468-2427.00075.

Scott, Allen J. 2008. "Culture, Economy, and the City." in *Social Economy of the Metropolis : Cognitive-Cultural Capitalism and the Global Resurgence of Cities*. Oxford University Press.

Scott, Allen J. 2011. "The Cognitive-Cultural Economy and the Creative City." *Social Economy of the Metropolis* 64–83. doi: 10.1093/acprof:oso/9780199549306.003.0004.

Scott, Allen John. 2008. "Social Economy of the Metropolis : Cognitive-Cultural Capitalism and the Global Resurgence of Cities." 197.

Settembre Blundo, Davide, Fernando Enrique García-Muiña, Martina Pini, Lucrezia Volpi, Cristina Siligardi, and Anna Maria Ferrari. 2019. "Sustainability as Source of Competitive Advantages in Mature Sectors: The Case of Ceramic District of Sassuolo (Italy)." *Smart and Sustainable Built Environment* 8(1):53–79. doi: 10.1108/SASBE-07-2018-0038.

Shannon-baker, Peggy, Susan Sweat Gunby, Joseph Drew, Plano Clark, and Senay Purzer. n.d. *Praise for the Third Edition*.

Sheppard, Eric. 2011. "Geography, Nature, and the Question of Development." *Dialogues in Human Geography* 1(1):46–75. doi: 10.1177/2043820610386334.

Szreter, Simon. 2002. "The State of Social Capital: Bringing Back in Power, Politics, and History." *Theory and Society* 31(5):573–621. doi: 10.1023/A:1021300217590.

Szreter, Simon, and Michael Woolcock. 2004. "Health by Association? Social Capital, Social Theory, and the Political Economy of Public Health."

International Journal of Epidemiology 33(4):650–67. doi: 10.1093/ije/dyh013.

UNIDO. 2015. *Mapping of Clusters in Cultural and Creative Industries in the Southern Mediteranean*.

United Nations. 2016. "The World's Cities in 2016: Data Booklet." *Economic and Social Affair* 29.

United Nations. 2021. "Sustainable Development Goals." Retrieved August 22, 2021 (https://sdgs.un.org/goals).

Wallman, Sandra, Mai Vidali, Rossella Lo Conte, and Montouri Bond, Virginia. 2018. "Themes and a Model" edited by S. Wallman. *The Capability of Places* 1–14.

White, Harrison C. 1981. "Where Do Markets Come From?" *American Journal of Sociology* 87(3):517–47.

Wolfe, Raymond N. 1976. "Trust, Anomia and Locus of Control: Alienation in U.S. College Students in 1964, 1969 and 1974." *The Journal of Social Psychology* 100:151–52.

World Bank. 2020. "World Bank Country Data - Egypt." Retrieved February 5, 2021 (https://data.worldbank.org/country/egypt-arab-rep).

Yin, Robert K. 2014. *Case Study Research, Design and Methods*. Sage Publications Ltd.

Young, Scott. 2008. "Learn More Study Less." *Young*. doi: 10.1017/CBO9781107415324.004.

Zucker, L. G. 1986. "The Production of Trust: Institutional Sources of Economic Structure, 1840-1920." *Research in Organizational Behavior* 8:53–111.

APPENDICES

Appendix 1. Ethics

- ### Ethical Approval Documents

Ethical approval application and documents are attached here and include:

- Ethics Application form
- Consent Form
- Participant Information Sheet
- Invitation Letter
- Recruitment Flyer
- Risk Assessment Form

- ### Ethical Approval Letter

Attached to this document is the ethics application approval letter from the University of Salford (14 November 2018).

14 November 2018

Nourhan Abdelrahman

Dear Nourhan,

RE: ETHICS APPLICATION STR1819-10 -Investigating Social Capital of Industry-based Grassroot Economies in Damietta, Egypt.

Based on the information you provided, I am pleased to inform you that your application STR1718-38 has been approved.

If there are any changes to the project and/ or its methodology, please inform the Panel as soon as possible by contacting S&T-ResearchEthics@salford.ac.uk

Yours sincerely,

Dr Anthony Higham
Chair of the Science & Technology Research Ethics Panel

Ethics approval must be obtained by all postgraduate research students (PGR) <u>prior</u> to starting research with human subjects, animals or human tissue.

The student must discuss the content of the form with their dissertation supervisor who will advise them about revisions. A final copy of the summary will then be agreed and the student and supervisor will 'sign it off'.

The signed Ethics Approval Form and application checklist must be <u>e-mailed</u> to your Research Centre Support team in the Research & Enterprise Division:

School of Arts & Media A&M-ResearchEthics@salford.ac.uk	**Salford Business School** SBS-ResearchEthics@salford.ac.uk	**School of the Built Environment** S&T-ResearchEthics@salford.ac.uk

School of Computing, Science & Engineering S&T-ResearchEthics@salford.ac.uk	**School of Environment & Life Sciences** S&T-ResearchEthics@salford.ac.uk

For staff and PGR ethics applications to the **School of Health Sciences**, please follow the process as detailed on the Health Ethics website – Click Here.

For staff and PGR ethics applications to the **School of Nursing, Midwifery, Social Work & Social Sciences**, please follow the process as detailed on the Health Ethics website – Click Here.
Or contact – Health-ResearchEthics@salford.ac.uk

Application Checklist

The checklist below helps you to ensure that you have all the supporting documentation submitted with your ethics application form. This information is necessary for the Panel to be able to review and approve your application. Please complete the relevant boxes to indicate whether a document is enclosed and where appropriate identifying the date and version number allocated to the specific document (*in the header / footer*), Extra boxes can be added to the list if necessary

Document	Enclosed? (Indicate appropriate response)		Date	Version No.
Application form	Mandatory	**If not required, please give a reason**	13 Sept 2018	1
Risk Assessment Form	Not Required	All answers to section 11 of this form are "No".	--	--
Participant Invitation Letter	Yes		9 Sept 2018	1
Participant Information Sheet	Yes		9 Sept 2018	1
Participant Consent Form	Yes		9 Sept 2018	1
Participant Recruitment Material – e.g. copies of posters, newspaper adverts, website	Yes		10 Sept 2018	1
Organisation Management Consent / Agreement Letter	Not Required	Research doesn't include organisational involvement.	--	--
Research Instrument – e.g. questionnaire	Yes			
Draft Interview Guide	Yes			
National Research Ethics Committee consent	Not Required	Research is not health-related.	--	--

The form must be completed electronically; the sections can be expanded to the size required.

School	School of The Built Environment
Course of Study	PhD in Built Environment
Is this application a resubmission from a rejected application? Please state the reference number	Yes ☐ No ☒ Reference number:
Is this an amended version of a previous approved application? Please state the reference number	Yes ☐ No ☒ Reference number:
Is this a revision of an ongoing application? Please state the reference number	Yes ☐ No ☒ Reference number:
Has this project received external funding?	NO If **YES**, please provide name of Research Council or other funding organisation: Click here to enter text.
Do you use non-human genetic materials from outside UK for your research?	NO If **YES**, has this been collected since the 12th October 2014? NO

1a. Title of proposed research project

Investigating Social Capital of Industry-based Grassroot Economies in Damietta, Egypt.

1b. Is this project purely literature based?

Yes ☐   No ☒

---

2. Project Focus

In developing countries such as Egypt, a wide portion of industry is characterised as being at grassroots scale, in condensed clusters, as well as powerful in productivity and skill. **The aim of this research is to quantify social capital as a factor in economic sustainability of grassroot economies of a grassroot industry (case study: Furniture industry in Damietta, Egypt).**

3. Project Objectives

To achieve this aim, the following objectives are proposed:

- Survey and document the value chain for furniture industry grassroot economies in Damietta city.
- Develop a spatial mapping framework to measure the extent of complexity of Furniture Industry in Damietta (physical, anthropological and social).
- Quantify and measure Social Capital values of furniture industry in Damietta.
- Propose policy recommendations for the conservation and development of the economic local identity of furniture industry in Damietta.

4. Research Methodology

1.1. Approach to Theory Development

This research is attempting to investigate the volume of social capital and its relation to space and industry in Damietta – Egypt. From this conception, the research logical approach to theory is ***deductive***, where the research starts with a theoretical premise and hypothesis, aiming to test them (*Saunders et al., 2016*). The research intends to build on the existing literature and theories of social capital as a framework for understanding the dimensions of social capital, and applying this classification through data gathering and observations of the context, testing its applicability in the context under study, as well as opening generalisability of these theories for future research within similar contexts (*Saunders et al., 2016*; *Van Maanen, Sørensen, & Mitchell, 2007*).

The abovementioned approach and philosophy reflect on the methodological choice, which according to the nature of the research question, context and consequences, is a ***mixed methods research design***. Qualitative data will gathered in the first phase of the data collection (semi-structured interviews), followed by quantitative data (survey and crowdsourcing map); i.e. ***sequential exploratory mixed method research design*** (*Saunders et al., 2016*). Each data collection technique is further explained in the following sections of this chapter. The qualitative data gathered in phase 1 will be utilised as a basis for the refinement of the survey design and to gather exploratory insight of the context, participants as well as information on how to approach more participants for the survey and mapping exercises.

As mentioned in chapter 1 (Introduction to Research), the research query represents a ***combined exploratory and evaluative study***, which entails that the objective is to explore the different factors related to social capital in Damietta and evaluate/measure the volume of social capital as a reflection on spatial distribution of enterprises in the city (spatial factor).

This methodological choice allows for complementarity of qualitative meaning of the highly anthropological domain of social capital, as well as quantitative evidence of statistical data proving the effect of higher social capital on the city's industry. Mixed methods research also allows for triangulation technique and adds more generalisability to an otherwise singular case study, whereas the methodology of understanding social capital in this context can be duplicated in future research given the prospective area's contextual factors.

1.2. Research Strategy: Singular Case Study

Aligning with the purpose of the research, adopting case study strategy helps to illuminate the set of variables, decisions, processes and relationships (*Yin, 2014*) connecting social capital to small businesses in the local industry in Damietta. The interest in a singular case study relates to the unique complexity of the phenomenon (*Yin, 2014*) of the connection earlier mentioned in Damietta's local furniture industry. Focusing on this case generates detailed insights on the dimensions, indicators and interactions within the framework or social capital, using intensive and in-depth investigation in the real-life context of the city (*Saunders, M., Lewis, P.Tornhill, 2007*; *Yin, 2014*).

The case of Damietta Egypt encompasses rich dynamics related to a well-grounded local industry, a strong social structure and a compact spatial distribution of businesses in the city, which makes it an "unusual" case for to examine, solidifying the argument for single-case research design (*Yin, 2014*). The concentration on a certain industry's economy in Damietta also allows for a more profound framework with in-depth analysis and tangible

investigation of vulnerability in the city. Even though this case implies clear boundaries and indicators, the generalisability of the framework lies in the common factors that can be found in many cities in the global south, namely; local industry concentration, small-scale (MSME-based) economic cluster, and a strong long-term social structure in the business. With contextualising examination, the proposed framework can be replicated in different context for a variety of local industries.

1.2.1. Measured Dimensions

In order to construct validity of the research design, the operational measures for the concepts under social capital were identified (*Yin, 2014*). Social capital has been studied as a domain and its dimensions have evolved through various researchers' additions over time to include more dimensions and concepts. Building on the works of Putnam (*1995*, *2002*), Coleman (*1988*), Lin (*2001*) and Hunt (*Hunt et al., 2015*), a comprehensive assortment of social capital factors of measurements have been identified, namely; Social Cohesion, Networks and Norms as the main division. Social cohesion includes measures of social solidarity, trust and reciprocity. Networks includes Embedded Resources and Network Locations. Lastly, Norms comprise belief in activities collegiality and agreeing with collective rules. The following diagram illustrates the measurements adopted in the study for evaluating the volume of social capital.
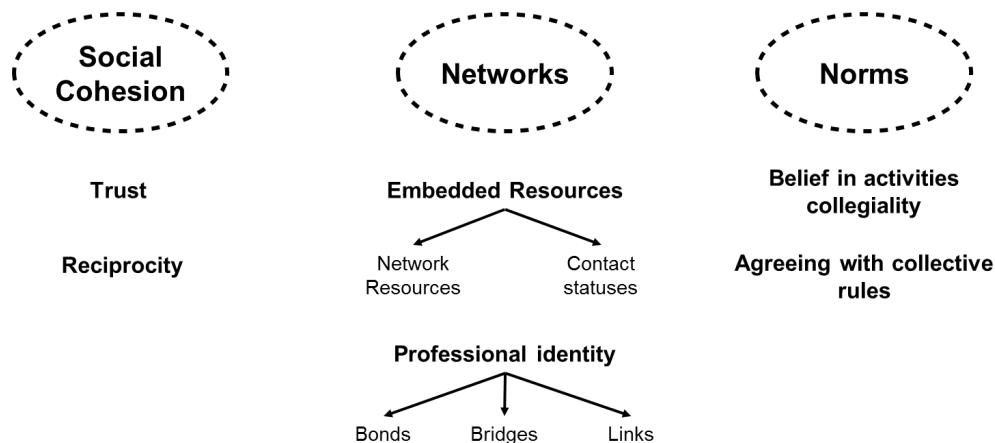
FIGURE 1 - FACTORS OF MEASUREMENT OF SOCIAL CAPITAL (*Coleman, 1988*; *Hunt et al., 2015*; *Koivumäki, 2013*; *Lin, 2001*; *Putnam, 1995, 2002*; *Putnam, Leonardi, & Nonetti, 1993*)**.**

1.2.2. Units of Analysis

This research adopts embedded case study analysis, in which the main case includes three subunits of analysis according to the above Figure 1 (social cohesion, networks and norms). The following diagram illustrates the levels of analysis in the embedded case study, where the biggest unit is the city (spatial factor of analysis), and the smallest is the individual owners of enterprises.

TABLE 1 - KINDS OF DATA NEEDED IN CASE STUDY LAYERS OF DIVISIONS (DEVELOPED FROM (*Yin, 2014*))

Units Being Characterised	Total System	Intermediate Units				Individuals
	Social Capital in the city's industry	*Social Cohesion Survey of enterprises/workshops*	*Network Density Survey of enterprises/workshops*		*Norms Survey of enterprises/workshops*	*Interviews with owners*
Enterprises / workshops	Spatial distribution (GIS data of city's furniture workshops + SMEs)	* Trust in other enterprises. * Reciprocity with other enterprises.	Embedded Resources	* Network Resources: Range of resources, best resources, variety of resources, composition (average resources), contact resources. * Contact Statuses: Contacts' occupation, authority, sector.	* Belief in activities collegiality. * Agreeing with collective rules.	
			Network Locations	* Bonds: exclusive interactions and solidarity among "people like us" that has the potential to lead to cooperation. * Bridges: inclusive solidarity among people of different backgrounds and can "traverse social gaps. * Links: account for relations that span vertical arrangements in society.		
Locals	Number of Employees in Enterprise					* Connections and network density. * Relation with employees. * Connection to outer market.

1.3. Research Time horizon

The research proposes a ***cross-sectional study*** (snapshot) (*Saunders et al., 2016*) of the dynamics of the social capital in a Damietta city at the time of the study. This is due to the fluid nature of the social capital and the acknowledgment of the possibility of continuous change in variables and weights of the different indicators in the study. This is also related to the time constraint of this PhD which doesn't allow for a longitudinal study that may extend for a few years in order to capture the changes in social capital in the city.

1.4. Research Methods and techniques

Several research data collection methods have been selected according to the aim, objectives and research strategy, as well as pragmatic considerations such as the timeframe of the research, the nature of the field understudy, the availability and access to data and the sociocultural setting of the community in the study area (*Saunders et al., 2016*). The research will be carried out through a single case study, including a pilot study consisting of a number of semi-structured interviews and an offline geospatial survey of social capital (crowdsourcing). Each strategy is discussed in further detail within the following sections.

1.4.1. Literature review

The core topics under study (social capital) has been described in literature through various theories (*Coleman, 1988*; *Lin, 2003*; *Putnam, 1995*, *2002*; *Putnam, Leonardi, & Nanetti, 1993*), it is important to review the different theoretical developments in the domain of social capital studies, in order to formulate a contextually suitable framework for Damietta city. Hence, the literature review will be conducted, taking into consideration the primary, secondary and tertiary sources in literature, in an attempt to spot the developments and gaps in research as well as concentration (or lack thereof) towards the topic under study. Another layer would be exploring the nature, dimensions and indicators of social capital, as well as the value chain for the furniture industry in general and within the context of Damietta. This will help evaluate the connections between the two. The third and vital layer would be to analyse valuation methodologies and previous researches in calculating social capital and reviewing the applicability of such methods with context-driven techniques in Damietta. This should take into consideration the degree of accuracy and allowable estimation measurements, and whether such estimations might affect the reliability or validity of research results. This phase along with the following phase will be utilized to create the framework which will be applied on the case study coastal city.

1.4.2. Semi-structured interviews (pilot / Phase 1)

The aim of the pilot study is multifaceted. Firstly, it will act as an exploratory exercise to get familiarised with a rather closed community of a small city, in terms of accessibility (*Yin, 2014*) to the physical space, to engage participants and to approach enterprises. Secondly, interviews with selected participants will allow for testing the topics and subtopics extracted from the theory (*Saunders et al., 2016*; *Yin, 2014*), and examine their applicability in this context on a small scale. Thirdly, the interviews will aim at extracting data from participants about the boundaries of the condensation of businesses in the city, hence informing the study boundaries for the mapping exercise in the second phase of data collection.

The study will comprise semi-structured Interviews that will be conducted with a sample of business owners of furniture industry workshops in Damietta. Participants should also be residents of the city (preferably long-term residents). The interview will tackle the issues in the social cohesion, network density and norms (as highlighted previously). The interview will comprise 3 parts, which aim at fulfilling the aims of the pilot study as follows, while suggested questions for the interviews are attached to this document.

Part 1: Interview questions (10 min):

- Discussion on participant's work and how his/her occupation relates to other occupations in industry in the city.
- Discussion on participant's work environment, work relations and connections he/she has with colleagues or peers in other businesses.
- Discussion on whether family and work networks overlap.

Part 2: Mapping (10 min):

- Pointing on a map of Damietta significant locations to the participant, including his/her workshop, locations of workshops/enterprises they work

with, and whether they have neighbours and family in the area working in furniture industry.

<u>Part 3: Draft Questionnaire (10 min):</u>
- Filling out a draft questionnaire (for the second phase of data collection) and giving feedback about their experience filling out the questionnaire for survey refinement.

This phase also includes secondary data collection of GIS maps and data on population, land use and other urban data from official organisations (GOPP and CAPMAS in Cairo, Egypt). However, in case data accessibility was jeopardised, a plan B for data base generation will be carried out in Phase 2 before commencing survey execution.

1.4.2.1.   Interviews Sampling
Sample size for this pilot will be **5-8 participants** (*Saunders et al., 2016*). Thematic analysis will be performed to extract factors and variables (themes include: enterprise size, number of employees, enterprise industrial activity, network density…etc.).

1.4.3.   Survey & Crowdsourced GeoSpatial Mapping (phase 2)

Following is the quantitative primary data gathering through a survey of enterprises (filled in by each enterprise's owner (who is usually main worker in SMEs). The survey will measure; (1) the dimensions of social capital (explained in Table 1), (2) data on employees and size of enterprise, and (3) the spatial locations of enterprises and relation to each other. These will be through dividing the survey into 2 question-based sections, and a third section which involves pointing the locations on the map.

TABLE 2 - MANUFACTURING ACTIVITIES ACCORDING TO FURNITURE INDUSTRY VALUE CHAIN
(*International Labour Organization, 2016*)

Stage in the Value Chain	Activities	Work Categories (quotas)	
Design		1	Design
Inbound		2	Purchasing
		3	Inbound logistics
Manufacturing	Manufacturing	4	Cutting and Carpentry
		5	Carving
		6	Veneering
		7	Finishing (staining, polishing etc.)
		8	Upholstery
	Assembly	9	Assembly
	Testing	10	Testing
Outbound		11	Value added services
		12	Packaging
Marketing, Sales and Distribution		13	Marketing
		14	Distribution and Sales (wholesalers, retailers, contract buyers and showrooms).
Services and support		15	Transportation
		16	After sales support

1.4.3.1. Survey Sampling

The sampling frame for this survey includes all enterprises in the city boundary (identified on the GIS map) that undertake any of the economic activities listed in the above Table 2 (activities along the furniture industry value chain), as well as being on the ground floor (directly related to the street network of the city), and owned by a resident of the city.

According to the estimated furniture industry enterprises division in Table 4, target population (total number of enterprises in Damietta) is ***38,612 enterprises***. In order to achieve 95% confidence level results with 1% margin of error (*Saunders et al., 2016*), the needed sample should be ***around 6,000 enterprises***. The minimum error margin has been selected (1%) since the target population includes categories, hence the highest possible accuracy will be needed to ensure statistical inference (*Saunders et al., 2016*). The sampling frame is divided into ***5 categories*** according to the size of enterprise (0-4 employees, 5-9, 10-24, 24-49, and 50+) (International Labour Organization (ILO), 2016, from Census Data 2013).

TABLE 3 - MAIN MAGNITUDE OF FURNITURE INDUSTRY CLUSTER IN DAMIETTA (*UNIDO (United Nations Industrial Development Organisation), 2015*)

	Number of Companies	Number of Jobs	Turnover	Exports	Creative Competitive advantage
Furniture in Damietta	36,000 (9,000 companies)	**~100,000**	934 M $ (in 2010)	351 M $ (in 2013)	Develop their own designs (style)

TABLE 4 - DISTRIBUTION OF ENTERPRISES IN furniture industry AS MSMEs CATEGORIES IN EGYPT (*International Labour Organization (ILO), 2016, from Census Data 2013*)

Year	Unit scale	Total number of employed persons	Total number of enterprises	Number of enterprises according to employee				
				Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
2006	Egypt	255,065	89,209	8,729	7,069	285	70	56
2013	Egypt	**270,222**	104,250	98,728	5,006	369	56	91
2013	**Estimate for Damietta ***	**100,000**	**38,612**	**36,566**	**1,854**	**137**	**21**	**34**

  * An estimate calculated by researcher as an estimate of categories in Damietta (from the following table through calculating the ratios according to the number of employees in the industry in Egypt vs in Damietta).

The sampling strategy adopted is ***stratified random sampling*** (*Saunders et al., 2016*). The choice was made according to an examination of the characteristics of the sampling frame, generalisation needed, geographic concentration and relevant strata as shown in the figure below.

The strata divisions and sample sizes for each stratum were decided according to two stratification variables, which are: size of enterprise and type of economic activity within the furniture industry value chain. The calculations are shown in Table 5. The stratified sample will be chosen using simple random sampling across the strata from the existing GIS map contents.

From the previous data and calculations, the sample number and relevant strata should be as follows:

TABLE 5 - SAMPLE SIZE WITH STRATA DIVISIONS (CALCULATED BY AUTHOR FROM ABOVE DATA)

				Total number of enterprises	Strata (Categories)				
					Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
Target Population				38,612	36,566	1,854	137	21	34
Calculated Sample Size				**6,000**	**5678**	**288**	**21**	**3**	**5**
Furniture Industry Strata									
Design	Design	1	Design		355	18	2	1	1
Inbound	Inbound	2	Purchasing		355	18	2	1	1
		3	Inbound logistics		355	18	2		
Manufacturing	Manufacturing	4	Cutting and Carpentry		355	18	2	1	1
		5	Carving		355	18	2		
		6	Veneering		355	18	2		
		7	Finishing (staining, polishing etc.)		355	18	2		
	Assembly	8	Upholstery		355	18	2		
		9	Assembly		355	18	2		
	Testing	10	Testing		355	18	2		
Outbound	Outbound	11	Value added services		355	18	2	1	1
		12	Packaging		355	18	2		
Marketing, Sales and Distribution	Marketing, Sales and Distribution	13	Marketing		355	18	2	1	1
		14	Distribution and Sales (wholesalers, retailers, contract buyers and showrooms).		355	18	2		
Services and support	Services and support	15	Transportation		355	18	2	1	1
		16	After sales support		355	18	2		
Calculated Sample Size				**6,012**	**5680**	**288**	**32**	**6**	**6**

1.4.3.2. Survey Logistics

Participants will be a sample of business owners of furniture industry workshops in Damietta. Participants should also be residents of the city (preferably long-term residents). The unit of analysis will be the enterprise/workshop.

Enumerators are required in order to achieve the target sample. The enumerators will be divided according to quotas and face-to-face survey entries will be required. Training prior to executing the fieldwork will be given to enumerators by the researcher to ensure consistency in data collection techniques applied. The survey will be paper-based with printed map to project relative locations on the map. Enumerators will also have access to GPS (through smartphones) in order to pinpoint locations and write coordinates on map.

The researcher is pursuing funding opportunities in order to cover the expenses of paid enumerators. However, an alternative approach would be the involvement of architecture students from Damietta as enumerators, benefiting from proper training and experiencing hands-on urban data collection.

Surveys will take place in the workspace of the participant as the enumerators will be passing by the enterprises according to a GIS map that they will be provided. Reference to the coded location of each enterprise on the map is crucial for the following part of the survey, which is the crowd-sourced map.

1.4.3.3. Participant Recruitment

The main technique for approaching participants will be through face-to-face interaction at their workspace, since the target population is ground-floor workshops and companies that can be publicly accessed upon the invitation of owner.

The researcher will also attempt to create deeper contact with workshop owners during the interviews in the pilot study. This will facilitate the accessibility to the community through being social within the confidence of trusted community/industry members.

1.4.3.4. Crowdsourced GIS mapping

Part of the survey will be pointing on the map where the location of the participant's workshop is as well as others they work with. The GIS datasets design is explained in further detail in a separate appendix. The locations of each survey entry and the related locations will be inputted on the GIS map and spatial analysis.

A further step that can be taken with the crowdsource map is to distribute an online survey, encouraging volunteers to add further entries from their circles (family and friends) in order to achieve a more holistic overview of the social capital through a bigger sample.

1.5. Analysis Of results

The following are primary planned layers of analysis, which are expected to further develop over the following period before and during the fieldwork:

- Factor Analysis of survey data.
- Spatial analysis of correlations between locations and relevant data.
- Spatial and statistical analysis of abundance and relations between different quotas.
- Spatial and statistical analysis of social relations between quotas.
- Content and interpretive analysis of interview data.

Finally, the analysis will be utilized to conclude development strategies and recommendations that optimize the current socioeconomic assets in Damietta and ensure a sustainable development path for the city based on its informal economies.

5. What is the rationale which led to this project?

The rationale behind this research can be explained as an overlap between complex factors that together form the unique situation of Damietta city today. Primarily the strong interlinked grassroot economies –comprising formal and informal economic activities- of furniture industry embedded in the city's social structure for almost a century, along with the need for an economic development model that understands and builds upon the existing tangible and intangible resources of the city of Damietta. However, recent ongoing national development strategy is creating largescale capitalistic foreign investment in the same area which raises questions on local economies, social capital and sustainable economies. Other inquiries of issues of visibility -of lack thereof- of grassroot economies as well as prioritisation of state over community stakes come to light in this particular case. Further analysis of each of the stated issues is presented in the subsections below.

- ### (In)visibility of Grassroot informal economies

Local informal economies effectively contribute to city scale GDP as well as national GDP in both developed and developing countries (*Horodnic, Rodgers, Williams, & Momtazian, 2018*). Jutting and Laiglesia (*2009*) highlight that two-thirds (1.8 billion) of the globe's working population work in the informal economy. When considering the context of developing countries, the latter is often found to be the mainstream economy (*Horodnic et al., 2018*; *Jütting & De Laiglesia, 2009*). Even though such evidence points towards the importance of inclusion of those local economies in the scope of the city's economic development, informal economies in many developing countries are deemed invisible to the municipalities and policymakers, if not considered as a syndrome that needs to be altered in nature to be incorporated.

Contrasting to conventional municipal perspective, Ruzek (2015) suggests that embracing informal economies can allow for more sustainable economies. Research in economic sustainability argues that informal economies offer an alternative way to capitalism and can shift the global focus from a globalized capitalist society to eco-localism. Literature supporting the notion of an inclusive economy, or as defined by Gibson-Graham as the diverse economy, highlights the importance of acknowledging that more than half of the economies in both rich and poor countries are non-capitalist in nature (*Gibson-Graham, 2006*).

In addition to that, it is also notable that the causes of informal economic activities go far beyond simply the intent of tax evasion, especially considering the context of developing countries, where policies and regulations might not allow for economic equity and inclusion of non-formalised activities, and where the nature of the urban life of a large percentage of the community relies on such activities.

- ### Industry-based cities and their economy

This research focuses on a specific type of context which is industry-based cities. In the beginnings of the 19th century, coinciding with the industrial revolution's effect on economic development in cities, various cities around the globe have developed a certain craft- or industry-related economy. During this period, the given craft or industry would be the main economic base of the city with most of the population's employment and businesses relating to it whether directly or indirectly. The industry is weaved into the social and physical structure of the city. Such examples of industry-based growth in cities

had emerged in both developed and developing countries. However, in the context of developing countries, the businesses have been passed down through generations during the 19th and 20th centuries, with no or little formal introduction into the modern legislative and taxation systems. In this sense, the local economies in this distinctive context is the main base of the city, and not a side activity that emerged besides the tax-paying businesses (as strongly argued against local informal economies). This unlocks issues of prioritization of grassroot economies in light of their contribution to employment and city identity, as well as issues of social integration and synergy within the different economic activities of the city.

- Vulnerability to Sea Level Rise

The implications of global warming and climate change processes form an unparalleled threat to the global community. An estimate of 0.13 degree global warming per decade is estimated as a result of the increase of concentration of greenhouse gases, as well as temperature increase projections that range between 1.1 and 6.4 degrees by the end of this century (*El-Raey, 2010*; *IPCC, 2014b*). These correspond to an increase in sea level rise, which ranges from a mild 18cm projection to more sceptical scenarios of more than 2m rise by the end of the 21st century (*El-Raey, 2010*). This is not including the correlation between climate change and the frequency and severity of natural hazards in countless spots around the globe. An increase in the number of hazardous events over the last few decades has been noted by major insurance companies as well as various studies (*Banholzer, Kossin, & Donner, 2014*; *Rosenthal & Rauch, 2013*).

Various studies have illustrated the vulnerability of Egypt as a nation to sea level rise. According to Dasgupta et al. (*2009*), Egypt is the most affected GDP amongst the North African nations by sea level rise. El-Raey *(2010)* also indicates that the highest population at risk due to sea level rise is Egypt, with a figure between 5 to 12 million inhabitants at risk. Climate change impacts in Egypt are most prevalent in north coastal zones overlooking the Mediterranean sea since this zone, first; is most vulnerable to sea level rise; and second exhibits the most damage to water, agriculture and tourism in urban agglomerations (*El-Raey, 1997*). Lowest land elevation on the north coast is the Nile Delta area, which extends for 250 km, along which lay multiple cities with high populations such as Alexandria, Port-Said, Rosetta and Damietta. Each of those cities encompasses a significant share of the Egyptian industrial and economic sectors, in addition to the high fertility of the Nile Delta's low lands (*El-Raey, 1997*).

TABLE 6 - POPULATION FIGURES AND GROWTH RATES FOR CAIRO, ALEXANDRIA AND DAMIETTA (*CAMPAS, 2017*).

City	City Population (thousands)	City Urban Population	
	2016	Urban Population (Thousands) 2016	Urban Population (%)
Cairo	19128*	19128*	100
Alexandria	4986	4985	98.2
Damietta	1360	545	39.4

* (*United Nations, 2016*).

Egypt is a developing country with an expanding population approaching 100 million in 2018 (*CAMPAS, 2017*). The highly multifaceted socioeconomic landscape in Egypt has been framed and reframed various times in this developing country's modern

history. The fluctuations in the political and economic policy strategies over the past century have had vast effects on the type, size and nature of economic activities that more than half of the population adopt, the informal economy. The major shift has been a result of the political shift between monarchy of the royal family of Mohamed Aly Pacha to a centrally-planned socialist state (*Elshamy, 2015*) in the 1950s. Although the informal economies in the beginning of the 20th century were a reflection of a highly agricultural nature among other factors, the centrality of the socialist state has been followed by the initiation of the economic liberalisation in 1973 (the infitah) marked a new stage where privatised economic activities could be effortlessly 'masked' (*Roy, 1992*).

- Sea Level Rise in Damietta

For Damietta city, its location on the verge of the Mediterranean and the Nile River, as well as overlooking Manzala Lake to the east and Damietta port to the west has placed it in a quite disagreeable setting with relation to sea level rise. The highest lands are those on which the old city is situated (by the Nile River), whereas elevation starts decreasing as the distance from the city centre increases. In this controversial situation, horizontal expansion of the city is quite unfavourable, especially with agricultural lands surrounding the old city and the small surrounding towns on the Nile. The following maps in Figure 2 and Figure 3 show the city's location, and a simulation of its high vulnerability to sea level rise. These particular circumstances imply discussions on whether investing in existing structures and economies would be a more environmentally adequate approach given the strong existing limitations of the sea, Nile River and low elevation agricultural land.

FIGURE 2 - GOOGLE SATELLITE IMAGERY OF DAMIETTA *(Google Maps, 2018)*
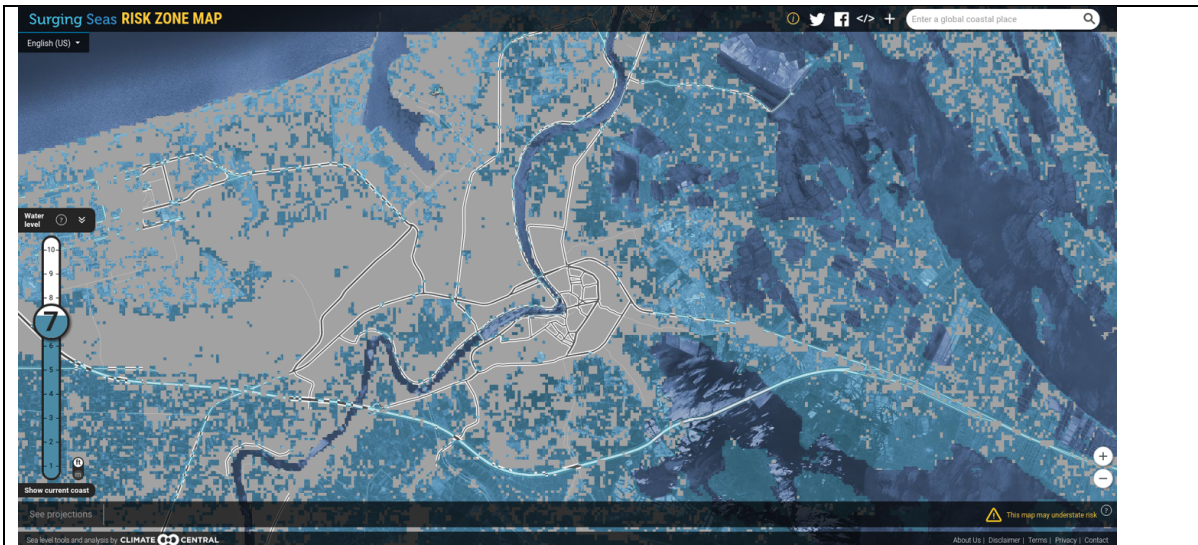
FIGURE 3 - SIMULATION OF 2M SEA LEVEL RISE SCENARIO (*Climate Central, 2018*).

- Controversial National Development approach in Damietta

The current political landscape in Egypt is enforcing a national economic direction of creating new mega projects in different areas. Examples are the new Administrative Capital east of Cairo, as well as new cities such as New Alameen and New Damietta (which are independent cities adjacent to the old city fabric but disconnected from it). This direction can be challenged as the "old" urban and economic infrastructure of the nation is put out of focus for the sake of new projects, leading to questionable rational of the development agenda.

Regarding Damietta's development, the government's new mega project (DFC) is focused on furniture industries with international funding and foreign investment and stated to be situated outside the boarders of the old city as a purposeful encouragement of the already existing furniture industry in the city. Although the publicised campaign of the project states a strong and well-defined path for economic prosperity, examining the facts closely proves otherwise. According to the sea level rise map below, not only is the whole region subject to sea level rise, but more specifically DFC site lies completely on land of elevation zero and +1m at most, leaving the whole plot vulnerable to sea level rise by the year 2080 (or 2100 at best). Given the magnitude of the investment in this project, it would be rather controversial to execute it on a plot that is expected to be submerged within 50 years' time.

From a socioeconomic perspective, Damietta's economic nature has been always associated with the entrepreneurial essence of its furniture industry. It is a unique context where cluster economies (similar to Sassuola, Italy) has evolved through decades and has been passed down from one generation to the next. Such a mega project outside the city would be drawing out not only the employment pool in the city, but also the income and local investment. Instead of developing the city's economy, the project –in its current form- is offering an autonomous industrial base where Damietta's population shifts to be worker-based rather than owners and entrepreneurs.
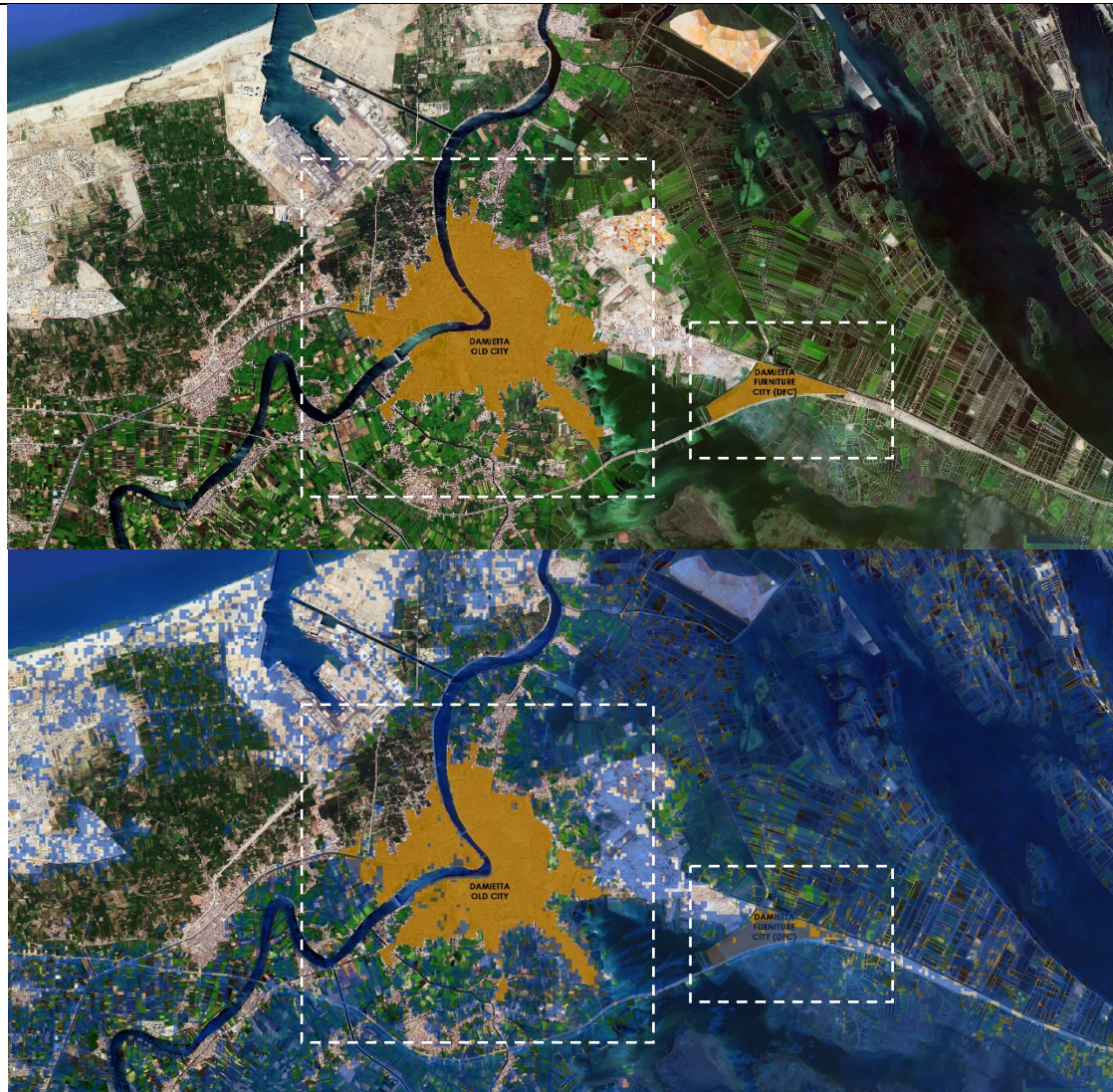
FIGURE 4 - 2M SEA LEVEL RISE SCENARIO AND ITS EFFECT ON THE OLD CITY AND THE DFC MEGAPROJECT (*Climate Central, 2018*)**.**

6. If you are going to work within a particular organisation, do they have their own procedures for gaining ethical approval?

(E.g. within a hospital or health centre?).

Yes ☐   No ☒

If **YES** – what are these and how will you ensure you meet their requirements?

Click here to enter text.

7. Are you going to approach individuals to be involved in your research?

Participants will be a sample of business owners of furniture industry workshops in Damietta. Participants should also be residents of the city (preferably long-term residents). The unit of analysis will be the enterprise/workshop.

Yes ☒   No ☐

If **YES** – think about key issues – for example, how you will recruit people? How you will deal with issues of confidentiality/anonymity? Then make notes that cover the key issues linked to your study.

The main technique for approaching participants will be through face-to-face interaction at their workspace, since the target population is ground-floor workshops and companies that can be publically accessed upon the invitation of owner.
The researcher will also attempt to create deeper contact with workshop owners during the interviews in the pilot study. This will facilitate the accessibility to the community through being social within the confidence of trusted community/industry members.

All collected information during the course of the research will be kept strictly confidential, and any information which leaves the university will have participant name and address removed so that the data cannot be recognised.
Participant data will be collected on paper through the interview/survey and through the videotaping/audiotaping. Participants' identities will be coded before use, hence keeping their identity safe. The data, transcripts and recordings will be kept private on password protected university machine accessed only by researcher. Participant data will be used for analysis of the researcher's doctoral thesis, and in other publications by the researcher. Access to identifiable data will be limited to the researcher, supervisor, and potentially research funding organisation.

8. More specifically, how will you ensure you gain informed consent from anyone involved in the study?

A package will be printed including information sheet, invitation and survey material in order to make sure each participant has the chance to read all information, and sign before participating in the study.

9. How are you going to address any Data Protection issues?

The followed procedure will strictly keep the participants' identities hidden, since all names and addresses will be coded before use. The data, transcripts and recordings will be kept private on password protected university machine accessed only by researcher. In case of any data leakage, the university will be notified and measures to retrieve the data will be taken.

10. Are there any other ethical issues that need to be considered? E.g. Research on animals or research involving people under the age of 18.

N.A.

11 (a) Does the project involve the use of ionising or other type of "radiation"
Yes ☐   No ☒

11 (b) Is the use of radiation in this project over and above what would normally be expected? E.g. in diagnostic imaging?
Yes ☐   No ☒

11 (c) Does the project require the use of hazardous substances?
Yes ☐   No ☒

11 (d) Does the project carry any risk of injury to the participants?
Yes ☐   No ☒

11 (e) Does the project require participants to answer questions that may cause disquiet/or upset to them?
Yes ☐   No ☒

If the answer to any of the questions 11(a)-(e) is **YES**, a risk assessment of the project is required and must be submitted with your application.

12. How many subjects will be recruited / involved in the study / research? What is the rationale behind this number?

- **Interviews Sample**

Sample size for this pilot will be 5-8 participants (Saunders et al., 2016). Thematic analysis will be performed to extract factors and variables (themes include: enterprise size, number of employees, enterprise industrial activity, network density…etc.).

- **Survey Sample**

The sampling frame for this survey includes all enterprises in the city boundary (identified on the GIS map) that undertake any of the economic activities listed in the above Table 2 (activities along the furniture industry value chain), as well as being on the ground floor (directly related to the street network of the city), and owned by a resident of the city.

According to the estimated furniture industry enterprises division in Table 4, target population (total number of enterprises in Damietta) is *38,612 enterprises*. In order to achieve 95% confidence level results with 1% margin of error (*Saunders et al., 2016*), the needed sample should be *around 6,000 enterprises*. The minimum error margin has been selected (1%) since the target population includes categories, hence the highest possible accuracy will be needed to ensure statistical inference (*Saunders et al., 2016*). The sampling frame is divided into *5 categories* according to the size of enterprise (0-4 employees, 5-9, 10-24, 24-49, and 50+) (International Labour Organization (ILO), 2016, from Census Data 2013).

TABLE 7 - MAIN MAGNITUDE OF FURNITURE INDUSTRY CLUSTER IN DAMIETTA (*UNIDO (United Nations Industrial Development Organisation), 2015*)

	Number of Companies	Number of Jobs	Turnover	Exports	Creative Competitive advantage
Furniture in Damietta	36,000 (9,000 companies)	**~100,000**	934 M $ (in 2010)	351 M $ (in 2013)	Develop their own designs (style)

TABLE 8 - DISTRIBUTION OF ENTERPRISES IN FURNITURE INDUSTRY AS MSMES CATEGORIES IN EGYPT (*International Labour Organization (ILO), 2016, from Census Data 2013*)

Year	Unit scale	Total number of employed persons	Total number of enterprises	Number of enterprises according to employee				
				Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
2006	Egypt	255,065	89,209	8,729	7,069	285	70	56
2013	Egypt	**270,222**	104,250	98,728	5,006	369	56	91
2013	**Estimate for Damietta ***	**100,000**	**38,612**	**36,566**	**1,854**	**137**	**21**	**34**

* An estimate calculated by researcher as an estimate of categories in Damietta (from the following table through calculating the ratios according to the number of employees in the industry in Egypt vs in Damietta).

The sampling strategy adopted is *stratified random sampling* (*Saunders et al., 2016*). The choice was made according to an examination of the characteristics of the sampling frame, generalisation needed, geographic concentration and relevant strata as shown in the figure below.

The strata divisions and sample sizes for each stratum were decided according to two stratification variables, which are: size of enterprise and type of economic activity within the furniture industry value chain. The calculations are shown in Table 5. The stratified sample will be chosen using simple random sampling across the strata from the existing GIS map contents.

FIGURE 0-5 - EXAMINATION OF SAMPLING FRAME AND POPULATION CHARACTERISTICS FOR SAMPLING STRATEGY CHOICE (SAUNDERS ET AL., 2016).

From the previous data and calculations, the sample number and relevant strata should be as follows:

TABLE 0-9 - SAMPLE SIZE WITH STRATA DIVISIONS (CALCULATED BY AUTHOR FROM ABOVE DATA)

				Total number of enterprises	Strata (Categories)				
					Less than 5 employees	5-9 employees	10-24 employees	24-49 employees	50+ employees
Target Population				38,612	36,566	1,854	137	21	34
Calculated Sample Size				**6,000**	**5678**	**288**	**21**	**3**	**5**
Furniture Industry Strata									
Design	Design	1	Design		355	18	2	1	1
Inbound	Inbound	2	Purchasing		355	18	2	1	1
		3	Inbound logistics		355	18	2		
Manufacturing	Manufacturing	4	Cutting and Carpentry		355	18	2	1	1
		5	Carving		355	18	2		
		6	Veneering		355	18	2		
		7	Finishing (staining, polishing etc.)		355	18	2		
	Assembly	8	Upholstery		355	18	2		
		9	Assembly		355	18	2		

	Testing	10	Testing		355	18	2		
Outbound	Outbound	11	Value added services		355	18	2	1	1
		12	Packaging		355	18	2		
Marketing, Sales and Distribution	Marketing, Sales and Distribution	13	Marketing		355	18	2	1	1
		14	Distribution and Sales (wholesalers, retailers, contract buyers and showrooms).		355	18	2		
Services and support	Services and support	15	Transportation		355	18	2	1	1
		16	After sales support		355	18	2		
Calculated Sample Size				6,012	5680	288	32	6	6

13. Please state which code of ethics has guided your approach (e.g. From Research Council, Professional Body etc).

This is an urban study which deals with urban as well as socioeconomic concerns for research ethics. Hence, the research ethical considerations abided by the *Economic and Social Research Council (ESRC) ethical guide*, as well as the *Social Research Association (SRA) Ethical Guidelines*.

Economic and Social Research Council (ESRC) ethical guide:
https://esrc.ukri.org/funding/guidance-for-applicants/research-ethics/

Social Research Association (ERA) Ethical Guidelines:
http://the-sra.org.uk/research-ethics/ethics-guidelines/

Remember that informed consent from research participants is crucial; therefore all documentation must use language that is readily understood by the target audience. Projects that involve NHS patients, patients' records or NHS staff, will require ethics approval by the appropriate NHS Research Ethics Committee. The University Ethics Panel will require written confirmation that such approval has been granted. Where a project forms part of a larger, already approved, project, the approving REC should be informed about, and approve, the use of an additional co-researcher.

References

Burrell, G., & Morgan, G. (1979). *Sociological Paradigms and organisational Analysis - Elements of the Sociology of Corporate Life*.
https://doi.org/10.1177/003803858001400219

CAMPAS. (2017). *Statistics of Egypt; Population Estimates 2017*. Retrieved from http://www.msrintranet.capmas.gov.eg/a2z.aspx

Coleman, J. (1988). Social Capital in the Creation of Human Capital. *The Americal Journal*

of Sociology, *94*(1988), S95–S120. https://doi.org/10.1037/0012-1649.22.6.723

Gittell, R. J., & Vidal, A. (1998). Social Capital and networks in Community Development; Framing the LISC Demonstration. In *Community Organizing: Building Social Capital as a Development Strategy* (pp. 13–32). Sage Publications Ltd.

Hunt, C. A., Durham, W. H., & Menke, C. M. (2015). Social Capital in Development: Bonds, Bridges, and Links in Osa and Golfito, Costa Rica. *Human Organization*, *74*(3), 217–229. https://doi.org/10.17730/0018-7259-74.3.217

International Labour Organization. (2016). *Skills for Trade and Economic Diversification (STED) in Egypt; The Case of the Furniture Industry (Arabic Version)*. Cairo.

Koivumäki, J. (2013). Measuring the social capital of professions: a study of dentists in Finland. *International Journal of Sociology and Social Policy*, *33*(7/8), 491–508. https://doi.org/10.1108/EL-01-2017-0019

Lin, N. (2001). Building a Network Theory of Social Capital. In R. Dubos (Ed.), *Social capital: Theory and research*. New York. https://doi.org/10.1108/14691930410550381

Lin, N. (2003). Social Capital: A Theory of Social Structure and Action. *Structural Analysis in the Social Sciences*. https://doi.org/10.1086/380538

Porter, M. E. (1990). the Competitive Advantage of Nations. *Harvard Business Review*. https://doi.org/10.1007/978-1-349-11336-1

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, (January), 65–78. https://doi.org/10.1007/978-1-349-62397-6

Putnam, R. D. (2002). *Bowling Alone : The collapse and Revival of American Community*. Simon & Schuster. Retrieved from https://books.google.co.uk/books/about/Bowling_Alone.html?id=rd2ibodep7UC

Putnam, R. D., Leonardi, R., & Nanetti, R. (1993). *Making democracy work : Civic Traditions in Modern Italy*. Princeton University Press. Retrieved from https://press.princeton.edu/titles/5105.html

Putnam, R. D., Leonardi, R., & Nonetti, R. Y. (1993). *Making Democracy Work; Civic Traditions in modern Italy*. *Making Democracy Work : Civic Traditions in Modern Italy*. https://doi.org/10.1017/CBO9781107415324.004

Saunders, M., Lewis, P.Tornhill, A. (2007). *Research Methods for Business Students*. *Pearson Education Limited 2*. https://doi.org/10.1007/s13398-014-0173-7.2

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2016). *Research Methods for Business Students* (Seventh). Pearson Education Limited.

Szreter, S. (2002). The state of social capital: Bringing back in power, politics, and history. *Theory and Society*, *31*(5), 573–621. https://doi.org/10.1023/A:1021300217590

Szreter, S., & Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. *International Journal of Epidemiology*, *33*(4), 650–667. https://doi.org/10.1093/ije/dyh013

UNIDO (United Nations Industrial Development Organisation). (2015). *Mapping of Clusters in Cultural and Creative Industries in the Southern Mediteranean*.

Van Maanen, J., Sørensen, J. B., & Mitchell, T. R. (2007). The interplay between theory and method. *Academy of Management Review*, *32*(4), 1145–1154. https://doi.org/10.5465/AMR.2007.26586080

Wallman, S. (Ed.). (2011). Themes and a Model. In *The Capability of Places* (pp. 1–14). London: Pluto Press.

Yin, R. K. (2014). *Case Study Research, Design and Methods*. Sage Publications Ltd.

Participant Information Sheet

Study Title: Investigating Social Capital of Industry-based Grassroot Economies in Damietta, Egypt.

PhD Researcher: Nourhan Abdel-Rahman.

I would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

NB: This information will be given to participants in person, and for participants who might be illiterate, the researcher will read the content to them, to make sure they understand the process.

What is the purpose of the study?

The logistic purpose of this study is the completion of the doctoral degree in Built Environment from the University of Salford.

As for the main research purpose, this study aims to investigate the volume of social capital (ie. Social cohesion, networks and norms) in small businesses working in furniture industry in Damietta city in Egypt. The aim is to measure the value added to the business through social networks and strong community links, which is a well-known asset in the city of Damietta.

Why have I been invited?

Target participants for this study involve residents of Damietta who are working in any occupation along the value chain of the furniture industry, including owners, employees and workers, from both genders. This is because the study is focusing on the furniture industry, small businesses in particular and population residing in Damietta.

Do I have to take part?

It is up to you to decide. I will describe the study and go through the information sheet, which I will give to you. I will then ask you to sign a consent form to show you agreed to take part. You are free to withdraw at any time, without giving a reason.

What will happen to me if I take part?

The study involves gathering data from participants on their business networks, social relations with peers in the industry, and relevant locations in the city to their businesses.

The interview / questionnaire is expected to take about 30 minutes of your time. The study will be videotaped/audiotaped for interview transcription. Please be assured that all data is confidential and any data used in publications will be completely anonymous.

The study will involve 3 parts:

Part 1: Interview questions (10 min):
- Discussion on your work and how your occupation relates to other occupations in industry in the city.
- Discussion on your work environment, work relations and connections you have with colleagues or peers in other businesses.
- Discussion on whether family and work networks overlap.

Part 2: Mapping (10 min):
- Pointing on a map of Damietta where you work, where others you work with are located on the map, and whether you have neighbours and family in the area working in furniture industry.

Part 3: Draft Questionnaire (10 min):
- Filling out a draft questionnaire about the same issues from the interview (social network, relations and norms).
- Optional: give feedback about your experience filling out the questionnaire for further improvements.

Expenses and payments?

You will not be liable to any expenses whatsoever in relation to this study. The researcher will conduct the study at a place convenient to you (home or workplace), which means you will not need to pay for extra transport for the meeting.

What will I have to do?

In the interview section of the study you only need to be yourself and speak freely.

For the mapping section, you will be expected to point on the map locations that relate to your business. The researcher will have a printed map of the city, and will assist you in identifying locations according to your own preferences through online maps. You are not expected to handle computer or mobile applications of any sort. The researcher will be doing this for you.

For the questionnaire section, you are expected to read and complete the copy handed to you. If you cannot read, or have difficulty reading or handling the questionnaire, please inform the researcher, and they will assist you in any way they can.

What are the possible disadvantages and risks of taking part?

The design of the questionnaire and interview avoids any security risks or discussion of sensitive information. The risk in this study is quite low since it takes social relations with no focus on political or governmental dimensions.

What are the possible benefits of taking part?

Since this study will be conducted with different users working in furniture industry, a potential benefit would be expanding your network through the researcher's contact with other participants.

What if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researcher, who will do their best to answer your questions (Nourhan Abdel-Rahman / +447378490145 / +201006660119 / n.h.abdelrahman@edu.salford.ac.uk).

If you remain unhappy having spoken to the researcher, you should contact the researcher's supervisor (Hisham ElKadi / h.elkadi@salford.ac.uk)

Please be assured that there are severe consequences to any researcher who brings about any harm to the participants of their study at the University of Salford, and in the UK in general. Hence, your convenience and personal as well as data safety are of high significance to the researcher and University.

Will my taking part in the study be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the university will have your name and address removed so that you cannot be recognised.

Your data will be collected on paper through the interview and through the videotaping/audiotaping. Participants' identities will be coded before use, hence keeping your identity safe. The data, transcripts and recordings will be kept private on password protected university machine accessed only by researcher. Your data will be used for analysis of the researcher's doctoral thesis, and in other publications by the researcher. Access to identifiable data will be limited to the researcher, supervisor, and potentially research funding organisation.

What will happen if I don't carry on with the study?

You can withdraw from the study/treatment but keep in contact with us if you'd like. Information collected may still be used. Any stored data or taped interviews that can still be identified as yours will be destroyed if you wish.

What will happen to the results of the research study?

The results of this study will be used for completion of the doctoral thesis of the researcher, as well as publications by the researcher. You could have access to the published work should you want to. Please note that you shall not be identified in any report/publication unless you give consent to this.

Who is organising or sponsoring the research?

The research is currently not funded by any organisation, but future plans might include sponsors, in which case, you will be informed of their identity.

Further information and contact details:

Researcher contact info:

Nourhan Abdel-Rahman.
n.h.abdelrahman@edu.salford.ac.uk
+447378490145

For complaints, please contact:

Hisham ElKadi
h.elkadi@salford.ac.uk

Participant Invitation Letter

A study on Space and Social Capital
*Investigating Social Capital of Industry-based
Grassroot Economies in Damietta, Egypt.*

Dear Sir/Madam,

We would appreciate your participation in this research study. The researcher conducting this project at the University of Salford is investigating social capital as a collective asset among small businesses in the furniture industry in Damietta city.

The study involved gathering data from participants on their business networks, social relations with peers in the industry, and relevant locations in the city to their businesses. The researcher aims to talk to individuals working in different occupations in the value chain of the furniture industry, including owners, employees and workers, from both genders. The interview / questionnaire is expected to take about 30 minutes of your time.

If you decide to take part in this study, please inform the researcher, and she will introduce to you the project details in person or via telephone, set up a meeting time and venue fitting your convenience, and conduct the interview / questionnaire with you in person.

Please read the enclosed information leaflet carefully. Please reply via email or telephone to the contacts stated below, with whether you are interested in participating in this study. If you are interested, upon your reply, the researcher will be in contact with you shortly to set up the meeting.

Thank you for your participation.

Yours Sincerely,

Nourhan Abdel-Rahman.

*PhD Researcher at University of Salford
School of Built Environment.*

School of the Built Environment
University of Salford

PARTICIPANTS NEEDED FOR
RESEARCH IN:

SOCIAL CAPITAL IN FURNITURE INDUSTRY IN DAMIETTA

We are looking for volunteers to take part in a study of:

Investigating Social Capital of Industry-based Grassroot Economies in Damietta, Egypt.

As a participant in this study, you would be asked to:

Participate in an interview and questionnaire about your social relations with peers in the furniture industry in Damietta.

Your participation would involve *1* session, taking 30 minutes of your time.

For more information about this study, or to volunteer for this study, please contact:

Nourhan Abdel-Rahman.

n.h.abdelrahman@edu.salford.ac.uk
+447378490145

This study has been reviewed by, and received ethics clearance through ethics committee at University of Salford.

If you would like to complain about any aspect of the study, please contact: Hisham ElKadi, Email: h.elkadi@salford.ac.uk

Risk Assessment Form

ALL projects MUST include a risk assessment. If this summary assessment of the risk proves insignificant, i.e. you answer 'no' to all of the questions, then no further action is necessary. However, if you identify any risks then you must identify the precautions you will put in place to control these.

1. What is the title of the project?

Investigating Social Capital of Industry-based Grassroot Economies in Damietta, Egypt.

2. Is the project purely literature based?   YES/NO

If YES, please go to the bottom of the assessment and sign where indicated. If NO, then please complete section 3 and list your proposed controls.

3. Please highlight the risk(s) which applies to your study:

Hazards	Risks	If yes, consider what precautions will be taken to minimise risk and discuss with your Supervisor
Use of ionising or non-ionising radiation	*Exposure to radiation* **NO**	*Obtain copy of existing risk assessment from place of research and attach a copy to this risk assessment summary.* *N.A.*
Use of hazardous substances	*Exposure to harmful substances* **NO**	*Obtain copy of existing risk assessment from place of research and attach a copy to this risk assessment summary.* *N.A.*
Use of face-to-face interviews *Interviewees could be upset by interview and become aggressive or violent toward researcher*	*Interviewing …* *Own classmates=Low risk* **YES/ NO** *Other University students=Medium risk* **YES/ NO** *Non-University personnel=High risk* **YES/NO**	**NB:** *Greater precautions are required for medium & high risk activities* ***How contact with participants will be made - i.e. do not give out personal mobile number, home number or home email, etc.*** • The researcher will contact the participants 3 weeks before the interview period through email or phone calls to set up the meeting. • The researcher will only give email and telephone number as contact info (in case interviewees need to change the date or ask about anything). • The researcher will send the information sheet beforehand to interviewees/participants via email or face-to-face to make sure they have all needed information.

Version [x]   Date   [x]

University of
Salford
MANCHESTER

		• Enumerators will be given a training session and orientation before getting involved in the survey. • Enumerators will be local university students, who will perform the survey with people they previously know, hence unitising trusted contacts in the city, decreasing fieldwork risks. ***Location of interviews – to be held in a safe environment, e.g. University building, workplace.*** • The interviews will be held at the workspace owned by the interviewee (workshop/enterprise), to make sure they are comfortable and more relaxed. • The researcher will make sure to be aware of the fire procedures / where building exists are / ensure building exits are clear before starting work. ***What support will be available, i.e. will anyone else be available to assist if you call for help, etc. e.g. a colleague knows where the interview is to take place and will be contacted when completed and safe – and what action to take after a certain time if not contacted*** • The supervisor will be informed of the interviews dates, timings and places beforehand. • A trusted local contact will be informed of the interviews dates, timings and places beforehand, and contacted when completed. • The contact will inform the authorities in case any violence occurs (highly unlikely since the context of the questions will not be sensitive in any way). ***How to deal with aggressive/violent behaviour, what precautions will be taken to prevent this from happening?*** • Researcher will not respond to or engage in behaviour that could be interpreted as confrontational. • Researcher will avoid any situation that may seem compromising. • In the instance of an adverse event, the incident reporting procedures at University of Salford will be followed.
Use of face-to-face interviews *Participants or*	**YES/NO**	***Consider:*** • *What initial and subsequent support will be made available for participants or interviewees?*

University of
Salford
MANCHESTER

interviewees could become upset by interview and suffer psychological effects		• What to do if researcher uncovers information regarding an illegal act? • What/who will be used to counsel distressed participants/interviewees, and what precautions will be taken to prevent this from happening? *N.A.*
Sensitive data	Exposure to data or information which may cause upset or distress to the researcher **YES/<u>NO</u>**	***Consider:*** • What initial and subsequent support will be available to the researcher *N.A.*
Physical activity	Exposure to levels of exertion unsuitable for an individual's level of fitness **YES/<u>NO</u>**	***Consider:*** • Health Questionnaire/ Medical declaration form / GP clearance. • Trained First Aid personnel/ Equipment. *N.A.*
Equipment	Exposure to faulty or unfamiliar equipment. **YES/<u>NO</u>**	***Consider:*** • Equipment is regularly checked and maintained as per manufacturer's instructions. • Operators receive adequate training in the use of. • Participants receive induction training prior to use. *N.A.*
Sensitive issues i.e. Gender/Cultural e.g. when observing or dealing with undressed members of the <u>opposite sex</u>	Exposure to vulnerable situations/ sensitive issues that may cause distress to interviewer or interviewee **<u>YES</u>/NO**	***Consider:*** **Use of chaperones/translators.** • The researcher speaks the native language of the interviewees, hence no issue in language barriers. • Researcher and enumerators will make sure to abide by cultural values of the community such as humble dressing, since most of the interviewees/participants are men, who might be offended by more modern clothing of females. ***What initial and subsequent support will be made available for participants or interviewees?*** • Researcher and enumerators will make to give interviewees/participants the information sheet beforehand via email or face-to-face to make sure they have all needed information.

Children	**YES/_NO_**	• _Adhere to local guidelines and take advice from research supervisor._ _N.A._
Manual handling activities	_Exposure to an activity that could result in injury_ **YES/_NO_**	• _Adapt the task to reduce or eliminate risk from manual handling activities. Ensure that participants understand and are capable of the manual handling task beforehand._ • _Perform health questionnaire to determine participant fitness prior to recruitment._ _N.A._

If you have answered 'YES' to any of the hazards in section 3, then please list the proposed precautions below:

How contact with participants will be made - i.e. do not give out personal mobile number, home number or home email, etc.
- The researcher will contact the participants 3 weeks before the interview period through email or phone calls to set up the meeting.
- The researcher will only give email and telephone number as contact info (in case interviewees need to change the date or ask about anything).
- The researcher will send the information sheet beforehand to interviewees/participants via email or face-to-face to make sure they have all needed information.
- Enumerators will be given a training session and orientation before getting involved in the survey.
- Enumerators will be local university students, who will perform the survey with people they previously know, hence unitising trusted contacts in the city, decreasing fieldwork risks.

Location of interviews – to be held in a safe environment, e.g. University building, workplace.
- The interviews will be held at the workspace owned by the interviewee (workshop/enterprise), to make sure they are comfortable and more relaxed.
- The researcher will make sure to be aware of the fire procedures / where building exists are / ensure building exits are clear before starting work.

What support will be available, i.e. will anyone else be available to assist if you call for help, etc. e.g. a colleague knows where the interview is to take place and will be contacted when completed and safe – and what action to take after a certain time if not contacted
- The supervisor will be informed of the interviews dates, timings and places beforehand.
- A trusted local contact will be informed of the interviews dates, timings and places beforehand, and contacted when completed.
- The contact will inform the authorities in case any violence occurs (highly unlikely since the context of the questions will not be sensitive in any way).

How to deal with aggressive/violent behaviour, what precautions will be taken to prevent this from happening?
- Researcher will not respond to or engage in behaviour that could be interpreted as confrontational.

Version [x]   Date   [x]

- Researcher will avoid any situation that may seem compromising.
- In the instance of an adverse event, the incident reporting procedures at University of Salford will be followed.

Use of chaperones/translators.
- The researcher speaks the native language of the interviewees, hence no issue in language barriers.
- Researcher and enumerators will make sure to abide by cultural values of the community such as humble dressing, since most of the interviewees/participants are men, who might be offended by more modern clothing of females.

What initial and subsequent support will be made available for participants or interviewees?
- Researcher and enumerators will make to give interviewees/participants the information sheet beforehand via email or face-to-face to make sure they have all needed information.

Signature of student .... Date   8/10/2018

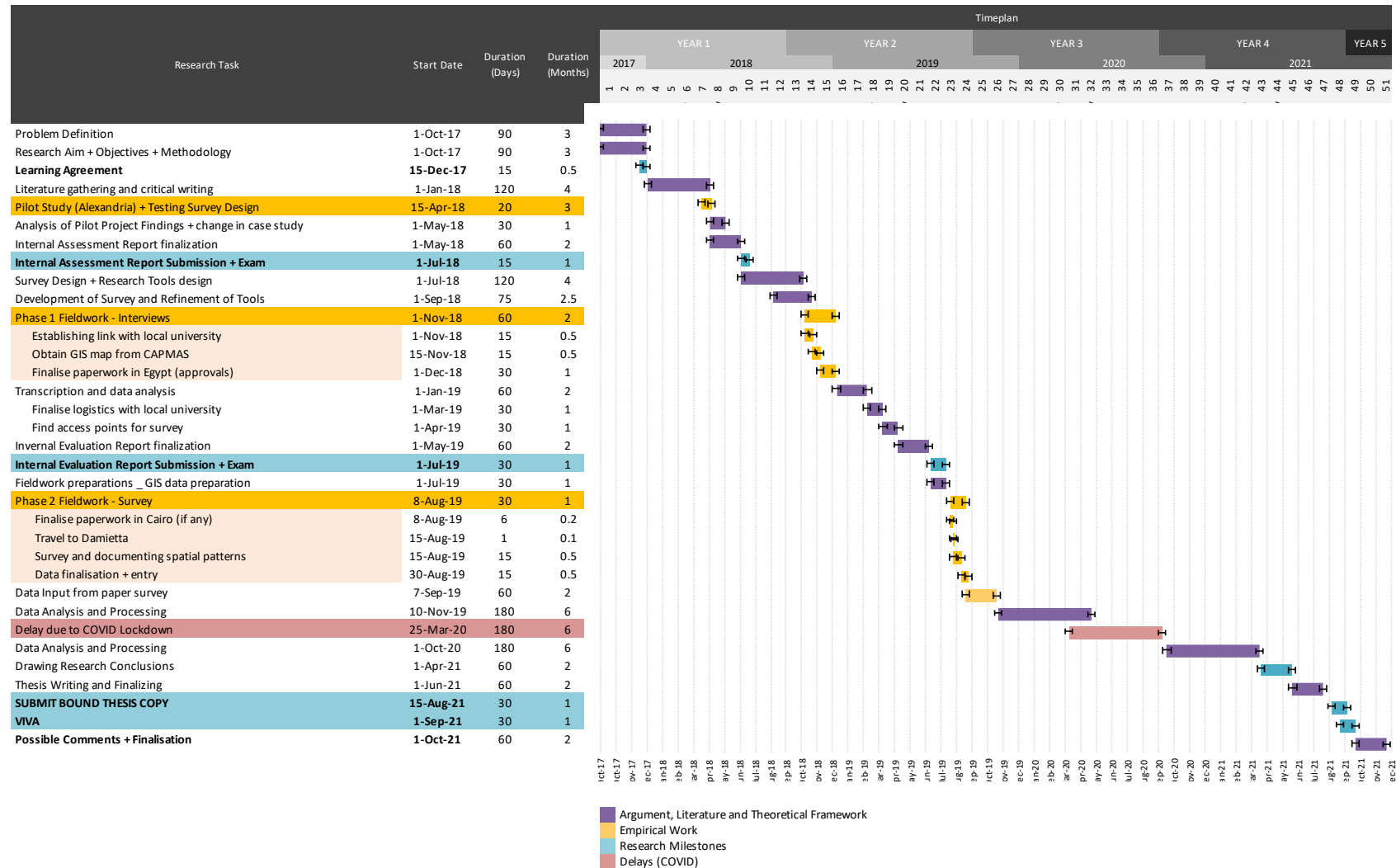Signature of Supervisor .... Date   9. 10. 18

Appendix 2. Research Time Plan

This Gantt chart allocates the research phases into time-based tasks. This timeframe was evaluated and adjusted according to the development of the research periodically. It is worth mentioning that the COVID-19 UK lockdown has delayed the data analysis phase for a good period of 6 months.

Research Task	Start Date	Duration (Days)	Duration (Months)
Problem Definition	1-Oct-17	90	3
Research Aim + Objectives + Methodology	1-Oct-17	90	3
Learning Agreement	**15-Dec-17**	15	0.5
Literature gathering and critical writing	1-Jan-18	120	4
Pilot Study (Alexandria) + Testing Survey Design	15-Apr-18	20	3
Analysis of Pilot Project Findings + change in case study	1-May-18	30	1
Internal Assessment Report finalization	1-May-18	60	2
Internal Assessment Report Submission + Exam	**1-Jul-18**	15	1
Survey Design + Research Tools design	1-Jul-18	120	4
Development of Survey and Refinement of Tools	1-Sep-18	75	2.5
Phase 1 Fieldwork - Interviews	1-Nov-18	60	2
Establishing link with local university	1-Nov-18	15	0.5
Obtain GIS map from CAPMAS	15-Nov-18	15	0.5
Finalise paperwork in Egypt (approvals)	1-Dec-18	30	1
Transcription and data analysis	1-Jan-19	60	2
Finalise logistics with local university	1-Mar-19	30	1
Find access points for survey	1-Apr-19	30	1
Invernal Evaluation Report finalization	1-May-19	60	2
Internal Evaluation Report Submission + Exam	**1-Jul-19**	30	1
Fieldwork preparations _ GIS data preparation	1-Jul-19	30	1
Phase 2 Fieldwork - Survey	8-Aug-19	30	1
Finalise paperwork in Cairo (if any)	8-Aug-19	6	0.2
Travel to Damietta	15-Aug-19	1	0.1
Survey and documenting spatial patterns	15-Aug-19	15	0.5
Data finalisation + entry	30-Aug-19	15	0.5
Data Input from paper survey	7-Sep-19	60	2
Data Analysis and Processing	10-Nov-19	180	6
Delay due to COVID Lockdown	25-Mar-20	180	6
Data Analysis and Processing	1-Oct-20	180	6
Drawing Research Conclusions	1-Apr-21	60	2
Thesis Writing and Finalizing	1-Jun-21	60	2
SUBMIT BOUND THESIS COPY	**15-Aug-21**	30	1
VIVA	**1-Sep-21**	30	1
Possible Comments + Finalisation	**1-Oct-21**	60	2

Legend:
- Argument, Literature and Theoretical Framework
- Empirical Work
- Research Milestones
- Delays (COVID)

Appendix 3. Interview Questions

Basic Respondent Data

- Respondent Name; Respondent Age; Respondent gender; Name of enterprise; Location
- What is your role in this enterprise?
- What is your highest educational certification?
- Are you married?
- Do you have children? How many? Do they work with you in the enterprise?
- How many years have you lived in Damietta?
- When was the enterprise established?

Spatial Data (about the city)

- Are there certain areas that exhibit more condensation of furniture industry enterprises?
- Is there a division of the city according to furniture industry activities?
- Would you say your enterprise is in the centre of the furniture market in the city?
- If you were to expand your enterprise, where would you prefer your new workshop to be? And why?
- Is the main concentration of furniture industry in Damietta city? Or are there other well known areas?

Market Data (Supply chain/economic activity/patterns of work)

- What are other businesses that you have to deal with to complete your work?
- Which activities are absolutely necessary for the furniture industry? Do you consider yours as one of them?
- Would you say the furniture sector in Damietta is booming or diminishing? And why?
- Would you say your enterprise is successful/profitable? How would you rate your profits in the market?
- Does that apply to other enterprises in the field? Are many enterprises in a similar state to your own?
- How would people measure their success in the furniture sector? In Money, fame in Damietta and other places, Connections in the sector?
- Do you have others working with you in your enterprise?
- Do you usually hire family members, friends or people recommended through your contacts?

- Do you usually hire strangers if they have the right qualifications?
- What does a normal day at the workshop look like?
- What does a loaded workday at the workshop look like?
- Is transport a hassle? Do you find difficulty sending or receiving goods/materials to other enterprises?
- Would you move your work to DFC? Why?

Entities encouraging collective identity

- What is the role of CWWFI regarding the collective identity in Furniture sector in Damietta?
- Are there other entities/collective bodies that encourage collective identity in the furniture sector in Damietta?

Relation to Global Market

- Do you work outside of Damietta? National, International?

Social Capital + Network Data

- Do you have a lot of contacts in the furniture industries in Damietta? Can you give examples?
- Are you close with all your contacts? Is it because of work relations or friendship over time?
- Are your contacts close to your workshop? Did this encourage a closer relations and more work between your enterprises?
- Do you trust your contacts? Why? Examples?
- Do you work more frequently with people you know?
- Are you open to working with new people you don't know?
- Are all your contact similar in the market to you (in terms of power)? Do you have relations with powerful people in the industry in the city?
- Do you have a lot of work outside Damietta?

Relation to DFC

- Do you work with DFC? If not, would you like to in the future?
- Do you know others who work with DFC as enterprises?
- What do you think of this development direction? How would it affect your business?

Appendix 4. Survey Variables Divisions

This appendix includes a list of variables with detailed account of their type, themes, subthemes, and relation to survey questions.

Survey and Mapping Variables

VarID	Type_of_Variable	VarName	VarLabel	VarFormat	Relative_Topic_of_Study	Question_Number_in_Survey	Question	Answer1	Answer2	Answer3	Answer4	Answer5	Answer6	Answer7	Answer8	Answer9	Answer10	Answer11	Answer12	Answer13	Answer14	Answer15	Answer16	Notes
V1	IV	ResID	Respondent_ID_in_Survey	Number	0a_SurveyID	1	Survey Entry Number																	
V2	IV	EnumID	Enumerator_ID	Number	0a_SurveyID	2	Enumerator Name																	
V3	IV	SurveyDate	Date_of_data_collection	Number	0a_SurveyID	3	Date of data collection																	
V4	IV	ResName	Respondent_Name	Text	0b_BasicRespondentData	4	Respondent Name																	
V5	IV	ResAgeRange	Respondent_Age_Range	Number	0b_BasicRespondentData	5	Respondent Age	20_30	31_40	41_50	51_60	61_70	above70											
V6	IV	ResSex	Respondent_Sex	MultipleChoice	0b_BasicRespondentData	6	Respondent gender	Male	Female															
V7	IV	EntName	Enterprise_Name	Text	0c_EnterpriseInfo	7	Name of enterprise;																	
V8	DV	4a_EntLoc_Lat	Enterprise_Location_Latitude	Coordinates	4a_LocationofEnterprise	8a	Please point on the map your enterprise's location																	
V9	DV	4a_EntLoc_Long	Enterprise_Location_Longitude	Coordinates	4a_LocationofEnterprise	8b	Please point on the map your enterprise's location																	
V10	DV	EntAct	Enterprise_Activity	CheckBoxes	0c_EnterpriseInfo	9	What is the Enterprise's business activity?	Design	Purchasing	Inbound logistic	Cutting and Car	Carving	Veneering	Finishing (stain	Upholstery	Assembly	Testing	Value added se	Packaging	Marketing	Distribution and	Transportation	After sales support	
V11	IV	EntAnnEarnings	Enterprise_AnnualEarnings	MultipleChoice	0c_EnterpriseInfo	10	Would you say this enterprise is successful/profitable? How would you rat	InDept	ThereIsWorkBu	SomeWorkWith	Profitable													Review Sca
V12	IV	ResEmp_Status	Respondent_Employment_Status	MultipleChoice	0d_RespondentStatus	11	What is your role in this enterprise?	Sole_Owner	Co_Owner	Manager	Employee	SeniorWorker	JuniorWorker											
V13	IV	ResEdu	Respondent_Education	MultipleChoice	0d_RespondentStatus	12	What is your highest educational certification?	Uneducated	ElementaryEdu	SecondaryEdu	IndustrySecond	UniversityDegre	UniversityDegre	Masters	Other									
V14	IV	MaritalStatus	Respondent_MaritalStatus	MultipleChoice	0e_RespondentFamilyData	13	Are you married?	Single	Married	Divorced	Widower													
V15	IV	NumChildren	Number_of_Children	Number	0e_RespondentFamilyData	14	Do you have children? How many?																	
V16	DV	1a_YrsLived	Years_lived_in_Damietta	Number	1a_Trust	15	How many years have you lived in Damietta?																	
V17	DV	1a_Generations	GenerationsLivedInDamietta	MultipleChoice	1a_Trust	16	Did previous generations of your family live in Damietta?	No	Yes1	Yes2	MoreThan2													
V18	DV	1a_EntYrsEst	Years_established_enterprise	Number	1a_Trust	17	When was the enterprise established?																	
V19	DV	1a_Friendlyness	Friendliness	Matrix	1a_Trust	18a	Would you say that people working in furniture industry in Damietta are fri	1_Definitely	2_ToAnExtent	3_IDontThinkSc	4_No													
V20	DV	1b_LookAfterOther	Looking_after_eachother	Matrix	1b_Reciprocity	18b	Would you say that Damietta's furniture industry community looks after on	1_Definitely	2_ToAnExtent	3_IDontThinkSc	4_No													
V21	DV	1a_trustOthers	Trusting_eachother	Matrix	1a_Trust	18c	Would you say that people working in furniture industry in Damietta trust o	1_Definitely	2_ToAnExtent	3_IDontThinkSc	4_No													
V22	DV	1a_SOBelonging	Sense_of_Belonging	Matrix	1a_Trust	19a	To what extent is this statement true: I feel a special sense of belonging w	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V23	DV	1a_trustColUnkn	Trust_Unknown_colleagues	Matrix	1a_Trust	19b	To what extent is this statement true: I have an inherent sense of trust in o	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V24	DV	1a_pride	Pride_to_be_part_of_profession	Matrix	1a_Trust	19c	To what extent is this statement true: I am proud to be part of the furniture	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V25	DV	1b_TrustColleagues	Trust_in_contacts_colleagues_need	Matrix	1b_Reciprocity	19d	To what extent is this statement true: I can trust in my contacts/colleagues	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V26	DV	1a_strangers	Strangers_in_Damietta	Matrix	1a_Trust	20	Do you often encounter strangers in the city?	1_All the time_a	2_Frequently_3	3_Sometimes	4_Seldom	5_Rarely_AlmostNever												
V27	DV	3a_ContactWFC	Knowledge_contact_withWFC	MultipleChoice	3a_Belief_in_Collegiality	22	Do you have contact with Woodwork Furniture Chamber?	1_Constant_Co	2_Attend_Event	3_Follow_Throu	4_No_Contact	5_I_didnt_Know_WFC_Exists												
V28	DV	3a_EffectWFC	Effect_of_WFC_on_Collegiality	MultipleChoice	3a_Belief_in_Collegiality	23	To what extent is this statement true: WFC encourages collective identity i	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V29	DV	1b_AskHelp	Asking_for_help_from_Others	Matrix	1b_Reciprocity	21a	How comfortable are you to: ask other business owners for materials/suppo	1_I_do_this_all	2_When_neces	3_When_neces	4_I_never_do_this													
V30	DV	1b_GiveHelp	Giving_help_to_Others	Matrix	1b_Reciprocity	21b	How comfortable are you to: Lend other business owners materials/suppo	1_I_do_this_all	2_When_neces	3_When_neces	4_I_never_do_this													
V31	DV	1b_GiveRecom	Giving_recommendations_someone_y	Matrix	1b_Reciprocity	21c	How comfortable are you to: Recommend another enterprise that you've	1_I_do_this_all	2_When_neces	3_When_neces	4_I_never_do_this													
V32	DV	1b_GiveRecomUnkn	Giving_recommendations_someone_y	Matrix	1b_Reciprocity	21d	How comfortable are you to: Recommend another enterprise that you nev	1_I_do_this_all	2_When_neces	3_When_neces	4_I_never_do_this													
V33	DV	1b_Coll_Int	Working_for_collective_interest	MultipleChoice	3a_Belief_in_Collegiality	24	To what extent do you agree with this statement: Furniture enterprises mu	1_DefinitelyAgr	2_SomewhatAg	3_StayedAbout	4_Definitelydisagree													
V34	DV	3a_CollectiveImage	Trust_evolution_in_time	MultipleChoice	3a_Belief_in_Collegiality	25	Do you think over the past 5 years, the sense of belonging to the furniture	1_GottenBetter	2_GottenWorse	3_StayedAboutTheSame														
V35	DV	2a_RangeOfResources	Range_Of_Resources_on_Market	CheckAllThatAp	2a_NetworkResources	37	What are the most important sources of market information for you (such a	1_SocialContac	2_CoffeeShopC	3_Newspapers	4_Television	5_Radio	6_WFC	7_BusinessCon	8_PoliticalAssoc	9_RelationWith	10_Internet							
V36	DV	Network_1_NameEnt	Network_Name_of_enterprise	Text	MultipleTopics	27	Name of enterprise;	Please state the most important contacts (as many as you like) whom you work with in the furniture sector in Damietta or outside																
V37	DV	Network_2_NameOwner	Network_Name_of_owner	Text	MultipleTopics	26	Owner/Contact Name;	Please state the most important contacts (as many as you like) whom you work with in the furniture sector in Damietta or outside																
V38	DV	Network_2b_SexOwner	Owner_Sex	MultipleChoice	MultipleTopics	28	Owner/Contact gender;	Male	Female															
V39	DV	Network_3_EntLoc_Lat	Enterprise_Location_Latitude	Coordinates	MultipleTopics	29a	Please point on the map your enterprise's location																	
V40	DV	Network_4_EntLoc_Long	Enterprise_Location_Longitude	Coordinates	MultipleTopics	29b	Please point on the map your enterprise's location																	
V41	DV	Network 5 Emp_Status	Employment_Status	MultipleChoice	2b1_Occupation	31	What is the contact's role in this enterprise?	Sole_Owner	Co_Owner	Manager	Employee	SeniorWorker	JuniorWorker											
V42	DV	Network_6_EntAct	Enterprise_Activity	MultipleChoice	MultipleTopics	30	Enterprise Activity;	Design	Purchasing	Inbound logistic	Cutting and Car	Carving	Veneering	Finishing (stain	Upholstery	Assembly	Testing	Value added se	Packaging	Marketing	Distribution and	Transportation	After sales support	
V43	DV	Network_7_Trust	Tie_with_Contact_trust	MultipleChoice	MultipleTopics	32a	To what extent is this statement true: I trust this contact	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V44	DV	Network_8_WorkFreq	Tie_with_Contact_Workfrequency	MultipleChoice	MultipleTopics	33	How frequently do you work with this contact?	1_Everyday	2_AFewTimesA	3_OnceAWeek	4_AFewTimesA	5_OnceAMonthOrLess												
V45	DV	Network_9_MeetFreq	Tie_with_Contact_Meetingfrequency	MultipleChoice	MultipleTopics	34	How frequently do you meet this contact?	1_Everyday	2_AFewTimesA	3_OnceAWeek	4_AFewTimesA	5_OnceAMonthOrLess												
V46	DV	Network_10_Auth	Tie_with_Contact_AuthorityInMarket	MultipleChoice	2b2_Authority	32b	To what extent is this statement true: This contact has a lot of pull in the m	1_DefinitelyTru	2_ToAnExtent	3_MyBusinessIr	4_ContactBusinessIsOnAHigherLevel													
V47	DV	Network_11_bond	Tie_with_Contact_Is_Contact_Bond_O	MultipleChoice	2c1 + 2c2	35	To what extent is this statement true: Me and this contact work on a simila	1_DefinitelyTru	2_ToAnExtent	3_IDontThinkSc	4_False													
V48	DV	Network 12 link	Tie_with_Contact_Is_Contact_link	MultipleChoice	2c3_Links	36	To what extent is this statement true: This contact works mostly from outsi	1_InsideDamiet	2_OutsideDami	5_alittlebitofboth														
V49	DV	Network_13_rankContact	Rank_All_contacts_given	Ranking	MultipleTopics	38	Please rank your contacts from the most essential to your business to the least.																	

IV Independent Variable
DV Dependent Variable

Appendix 5. Survey Design Variables Matrix

This appendix includes a matrix cross-tabulating variables in the survey with the research themes and subthemes from the framework. This is to ensure that variables and survey questions correspond to and address all themes and subthemes.

Q#	Survey Questions	Basic Data	1a- Trust	1b- Reciprocity	2a1- Range of resources	2a2- Best resources	2a3- Variety of resources	2a4- Composition	2b1- Contacts' occupation	2b2- Contacts' authority	2b3- Contacts' sector	2c1- Bonds	2c2- Bridges	2c3- Links	3a- Belief in activities collegiality	3b- Agreeing with collective rules	4a- Location of Enterprise	4b- Location of Bonds	4c- Location of Bridges	4d- Location of Links
		1- Social Cohesion			**2- Networks** / 2a- Embedded Resources				2b- Contact Statuses			2c- Network Locations			**3- Norms**		**4- Locations**			
1	Survey Entry Number	1																		
2	Enumerator Name	1																		
3	Date of data collection	1																		
4	Respondent Name	1																		
5	Respondent Age	1																		
6	Respondent gender	1																		
7	Name of enterprise;	1																		
9	What is the Enterprise's business activity?	1																		
10	Would you say this enterprise is successful/profitable? How would you rate your profits in the market´	1																		
11	What is your role in this enterprise?	1																		
12	What is your highest educational certification?	1																		
13	Are you married?	1																		
14	Do you have children? How many?	1																		
8a	Please point on the map your enterprise's location.																1			
8b	Please point on the map your enterprise's location.																1			
15	How many years have you lived in Damietta?		1																	
16	Did previous generations of your family live in Damietta?		1																	
17	When was the enterprise established?		1																	
18a	Would you say that people working in furniture industry in Damietta are friendly?		1																	
18b	Would you say that Damietta's furniture industry community looks after one another?			1																
18c	Would you say that people working in furniture industry in Damietta trust one another?		1																	
19a	To what extent is this statement true: I feel a special sense of belonging with others in the furniture industry in Damietta?		1																	
19b	To what extent is this statement true: I have an inherent sense of trust in others in the furniture industry, even if I never met them before?		1																	
19c	To what extent is this statement true: I am proud to be part of the furniture industry profession in Damietta.		1																	
19d	To what extent is this statement true: I can trust in my contacts/colleagues' help and support if I need it.			1																
20	Do you often encounter strangers in the city?		1																	
22	Do you have contact with Woodwork Furniture Chamber?														1					
23	To what extent is this statement true: WFC encourages collective identity in Furniture sector in Damietta.														1	1				
21a	How comfortable are you to: ask other business owners for materials/supporting workers when you have a sudden load of work?			1																
21b	How comfortable are you to: Lend other business owners materials/supporting workers when they ask due to a sudden load of work?			1																
21c	How comfortable are you to: Recommend another enterprise that you've previously worked with to a client?			1																
21d	How comfortable are you to: Recommend another enterprise that you never previously worked with to a client?			1																
24	To what extent do you agree with this statement: Furniture enterprises must work together for common interest and growth.														1	1				
25	Do you think over the past 5 years, the sense of belonging to the furniture sector in Damietta has gotten better, worse, or stayed about the same?														1					
36	What are the most important sources of market information for you (such as jobs, prices of goods or materials)?						1	1												
27	Name of enterprise;	1																		
26	Owner/Contact Name;	1																		
28	Owner/Contact gender;	1			1		1													
29a	Please point on the map your enterprise's location (Latitutde).													1				1	1	1
29b	Please point on the map your enterprise's location (Longitude).													1				1	1	1
31	What is the contact's role in this enterprise?								1	1										
30	Enterprise Activity;				1		1	1			1									
32a	To what extent is this statement true: I trust this contact.		1																	
33a	How frequently do you work with this contact?																			
33b	How frequently do you meet this contact?																			
32b	To what extent is this statement true: This contact has a lot of pull in the market.				1	1	1	1		1		1	1	1						
34	To what extent is this statement true: Me and this contact work on a similar level in the market in Damietta.				1	1	1	1				1	1	1						
35	To what extent is this statement true: This contact works mostly from outside Damietta.											1	1	1						
37	Please rank your contacts from the most essential to your business to the least.				1	1														
Total		16	10	6	5	3	5	4	1	2	1	3	3	5	4	2	2	2	2	2
Group Total		16	16		17				4			11			6		8			

Appendix 6. The Survey Design (English and Arabic)

This appendix includes the survey final form that was used in the field to collect data for social capital networks. The English form includes all questions, but the final design of the form was done in Arabic to be processed and used by the enumerators.

بحث ميداني - ورش صناعة الأثاث في دمياط
المعلومات الأساسية

٣ . تاريخ جمع البيانات	٢ . اسم المُعِد	١ . رقم استمارة الاستطلاع

٤ . اسم الشخص

٥ . عُمر الشخص

٦ . النوع
◯ ذكر   ◯ أنثى

٧ . اسم المؤسسة / الورشة

٨ . يرجى الإشارة على الخريطة موقع مؤسستك ، ويفضّل كتابة العنوان

خط العرض ....

خط الطول ....

١٠ . هل يمكن القول أن هذه الورشة / المؤسسة ناجحة / مربحة؟ كيف تقيم أرباحك في السوق؟

◯ في ديون
◯ يوجد أعمال – لكن لا صافي ربح
◯ يوجد بعض الأعمال وربح متوسط
◯ مربح

١١ . ما هو دورك في هذه الورشة / المؤسسة؟

◯ المالك الوحيد   ◯ موظف
◯ مالك مع شركاء   ◯ عامل كبير
◯ مدير   ◯ عامل صغير

١٢ . ما هي أعلى شهادة تعليمية حصلت عليها؟

◯ غير متعلم
◯ تعليم إبتدائي
◯ تعليم ثانوي عام
◯ تعليم ثانوي صناعي
◯ شهادة جامعية هندسية (عمارة – هندسة صناعية – مجال آخر ذو صلة بالأثاث)
◯ درجة جامعية غير مرتبطة بصناعة الأثاث
◯ ماجستير
◯ آخر (اذكر)

١٣ . هل انت متزوج؟

◯ غير مرتبط   ◯ مطلق
◯ متزوج   ◯ أرمل

١٤ . هل لديك أطفال؟ كم عددهم؟

١٥ . كم سنة عشت في دمياط؟

١٦ . هل عاشت الأجيال السابقة من عائلتك في دمياط؟

◯ لا
◯ نعم – جيل واحد
◯ نعم – جيلين
◯ نعم – أكثر من جيلين

١٧ . متى تم تأسيس هذه الورشة / المؤسسة؟

٩ . ما هو النشاط التجاري للورشة / المؤسسة؟

☐ التصميم   ☐ التجميع
☐ شراء   ☐ اختبار الجودة
☐ الخدمات اللوجستية واردة   ☐ الخدمات ذات القيمة المضافة
☐ القص والنجارة   ☐ التعبئة والتغليف
☐ نحت   ☐ تسويق
☐ القشرة الخشبية   ☐ التوزيع والمبيعات (تجار الجملة وتجار التجزئة)
☐ التشطيب (التلوين ، التلميع ، الخ) ☐ وسائل النقل
☐ تنجيد   ☐ بعد دعم المبيعات

بحث ميداني - ورش صناعة الأثاث في دمياط
معلومات الثقة والمعاملة بالمثل

٣ . تاريخ جمع البيانات	٢ . اسم المُعِد	١ . رقم استمارة الاستطلاع

١٨ . برجاء الإجابة على الأسئلة التالية :

لا	لا أعتقد	صحيح إلى حد ما	بالتأكيد صحيح	
○	○	○	○	هل يمكن القول أن العاملين في صناعة الأثاث بدمياط ودودون تجاه بعضهم البعض؟
○	○	○	○	هل يمكن القول إن مجتمع صناعة الأثاث في دمياط يعتني ببعضه البعض؟
○	○	○	○	هل يمكن القول أن العاملين في صناعة الأثاث في دمياط يثقون ببعضهم البعض؟

١٩ . إلى أي مدى تعتبر هذه العبارة صحيحة :

لا	لا أعتقد	صحيح إلى حد ما	بالتأكيد صحيح	
○	○	○	○	أشعر بحس خاص بالانتماء إلى الآخرين في صناعة الأثاث بدمياط؟
○	○	○	○	لدي شعور متأصل بالثقة في الآخرين في صناعة الأثاث في دمياط ، حتى لو لم ألتق بهم من قبل؟
○	○	○	○	أنا فخور بأن أكون جزءًا من مهنة صناعة الأثاث في دمياط .
○	○	○	○	يمكنني الوثوق في دعم زملائي / معارفي في سوق العمل إذا كنت بحاجة إلى مساعدة .

٢٠ . هل غالبًا ما تصادف غرباء في المدينة؟

○ تقريباً يومياً
○ في كثير من الأحيان (3 إلى 4 مرات في الأسبوع)
○ أحيانا (مرة واحدة في الأسبوع)
○ نادراً

٢٠ . ما مدى ارتياحك في :

لا أفعل هذا	عند الضرورة فقط ناس معينة	عند الضرورة أي شخص أعرفه	أفعل هذا في كل وقت	
○	○	○	○	سؤال أصحاب الورش الأخرى عن المواد / عمال عندما يكون لديك ضغط عمل مفاجئ؟
○	○	○	○	إعارة أصحاب الورش الأخرى مواد أو عمالة عندما يحتاجون بسبب ضغط عمل مفاجئ لديهم؟
○	○	○	○	التوصية لعميل جديد عن ورشة عملت معها سابقًا؟
○	○	○	○	التوصية لعميل جديد عن ورشة لم تعمل معها من قبل؟

٣ . تاريخ جمع البيانات		٢ . اسم المُعِد	١ . رقم استمارة الاستطلاع

٢٢ . هل لديك اتصال مع غرفة صناعة الأثاث الخشبي؟

○ إتصال مستمر من خلال الأعمال

○ حضور ندوات الغرفة ومتابعة الأحداث

○ متابع من خلال الآخرين

○ لا اتصال

○ لم أكن أعرف عن وجود غرفة صناع الأثاث الخشبي

٢٣ . إلى أي مدى تعتبر هذه العبارة صحيحة :

خطأ	لا أعتقد	صحيح إلى حد ما	بالتأكيد صحيح	
○	○	○	○	تشجع غرفة صناعة الأثاث الخشبي الهوية الجماعية في قطاع الأثاث بدمياط .

٢٤ . إلى أي مدى توافق على هذه العبارة :

لا أوافق	لا أعتقد	موافق إلى حد ما	بالتأكيد موافق	
○	○	○	○	يجب أن تعمل شركات الأثاث معا لتحقيق المصلحة المشتركة والنمو .

٢٥ . هل تعتقد على مدى السنوات الخمس الماضية ، أن الشعور بالانتماء إلى قطاع الأثاث في دمياط قد أصبح أفضل أو أسوأ أو بقي على حاله؟

○ أصبح أفضل

○ أصبح أسوأ

○ لم تتغير

معلومات المعارف في سوق العمل
(مجمعة)

٣٧ . ما هي أهم مصادر معلوماتك عن السوق (مثل الوظائف أو أسعار السلع أو المواد)؟

☐ التواصل الاجتماعي خلال الأقارب الأصدقاء الجيران

☐ دردشة القهوة / الكوفي شوب

☐ الصحف

☐ برامج التليفزيون

☐ راديو

☐ غرفة صناعة الأثاث الخشبي

☐ المعارف في سوق العمل

☐ معارف في المواقع حكومية/ مجلس الشعب أو ما شابه

☐ من خلال العلاقة مع مجلس مدينة دمياط

☐ الإنترنت

بحث ميداني - ورش صناعة الأثاث في دمياط
معلومات المعارف في سوق العمل

٣ . تاريخ جمع البيانات	٢ . اسم المُعِد	١ . رقم استمارة الاستطلاع

٢٦ . اسم المالك / الشخص الذي تعرفه

برجاء ذكر أهم معارفك في سوق العمل (اذكر ما تشاء عدداً) الذين تعمل معهم في قطاع الأثاث بدمياط أو خارجها .

....

٢٧ . اسم المؤسسة / الورشة

....

٢٨ . نوع المالك / الشخص الذي تعرفه

◯ ذكر   ◯ أنثى

٢٩ . يرجى الإشارة على الخريطة موقع مؤسستك ، ويفضل كتابة العنوان

خط العرض ....

خط الطول ....

٣٠ . ما هو النشاط التجاري للورشة / المؤسسة؟

☐ التصميم   ☐ التجميع
☐ شراء   ☐ اختبار الجودة
☐ الخدمات اللوجستية واردة   ☐ الخدمات ذات القيمة المضافة
☐ القص والنجارة   ☐ التعبئة والتغليف
☐ نحت   ☐ تسويق
☐ القشرة الخشبية   ☐ التوزيع والمبيعات (تجار الجملة وتجار التجزئة)
☐ التشطيب (التلوين ، التلميع ، الخ)   ☐ وسائل النقل
☐ تنجيد   ☐ بعد دعم المبيعات

٣١ . ما هو دور الشخص الذي تعرفه في هذه المؤسسة؟

◯ المالك الوحيد   ◯ موظف
◯ مالك مع شركاء   ◯ عامل كبير
◯ مدير   ◯ عامل صغير

٣٦ . هذا الشخص يعمل في الغالب :

◯ داخل دمياط
◯ خارج دمياط
◯ الاثنين

٣٢ . إلى أي مدى يصح هذا البيان :

خطأ	لا أعتقد	صحيح إلى حد ما	بالتأكيد صحيح	
◯	◯	◯	◯	أنا أثق في هذا الشخص .
◯	◯	◯	◯	هذا الشخص لديه الكثير من القوة / النفوذ في السوق .

مرة واحدة في الشهر أو أقل	عدد قليل من مرات في الشهر	مرة في الأسبوع	بضع مرات في الأسبوع	كل يوم	
◯	◯	◯	◯	◯	**٣٣ . ما هو معدل العمل بينك وبين ورشة هذا الشخص؟**
◯	◯	◯	◯	◯	**٣٤ . ما هو معدل التقائك بهذا الشخص؟**

الشخص الذي أعرفه يعمل في مستوى أعلى	أعمل في مستوى أعلى	صحيح إلى حد ما	بالتأكيد صحيح	
◯	◯	◯	◯	**٣٥ . إلى أي مدى هذه العبارة صحيحة :** أنا وهذا الشخص نعمل في مستوى مماثل في السوق في دمياط .

٣٨ . يرجى ترتيب معارفك من الأكثر أهمية للأقل أهمية بالنسبة لعملك .

١. .... ٣. .... ٥. ....

٢. .... ٤. .... ٦. ....

Basic Info

1. **Survey Entry Number**

   _____

2. **Enumerator Name**

   _____

3. **Date of data collection**

   _____

   Example: 15 December 2012

4. **Respondent Name**

   _____

5. **Respondent Age**

   _____

6. **Respondent Gender**
   Mark only one oval.

   ◯ Male

   ◯ Female

7. **Name of Enterprise**

   _____

8. **Please point on the map your enterprise's location (Latitude and Longitude).**

   _____

Map of Damietta

9. **What is the Enterprise's business activity?**
Tick all that apply.

- ☐ Design
- ☐ Purchasing
- ☐ Inbound logistics
- ☐ Cutting and Carpentry
- ☐ Carving
- ☐ Veneering
- ☐ Finishing (staining, polishing etc.)
- ☐ Upholstery
- ☐ Assembly
- ☐ Testing
- ☐ Value added services
- ☐ Packaging
- ☐ Marketing
- ☐ Distribution and Sales (wholesalers, retailers, contract buyers and showrooms)
- ☐ Transportation
- ☐ After sales support

10. **Would you say this enterprise is successful/profitable? How would you rate your profits in the market?**
Mark only one oval.

- ◯ In Dept
- ◯ No Net Income
- ◯ 0 to 100K EGP
- ◯ 101 to 200K EGP
- ◯ 201 to 500K EGP
- ◯ 501K to 1M EGP
- ◯ Above 1M

11. **What is your role in this enterprise?**
Mark only one oval.

- ◯ Sole Owner
- ◯ Co-Owner
- ◯ Manager
- ◯ Employee
- ◯ Senior Worker
- ◯ Junior Worker

12. **What is your highest educational certification?**
Mark only one oval.

- ◯ Uneducated
- ◯ Elementary Education
- ◯ Secondary Education
- ◯ Industrial Secondary Education
- ◯ University Degree (Engineering, Architecture, other industry-related)
- ◯ University Degree (unrelated to furniture industry)
- ◯ Masters
- ◯ Other

13. **Are you married?**
Mark only one oval.

- ( ) Single
- ( ) Married
- ( ) Divorced
- ( ) Widower

14. **Do you have children? How many?**

_____

15. **How many years have you lived in Damietta?**

_____

16. **Did previous generations of your family live in Damietta?**
Mark only one oval.

- ( ) No
- ( ) Yes, 1 generation
- ( ) Yes, 2 generations
- ( ) Yes, more that 2 generations

17. **When was the enterprise established?**

_____
Example: 15 December 2012

Trust and Reciprocity

18. **Please answer the following questions.**
Mark only one oval per row.

	Definitely	To an Extent	Neutral	I Don't Think So	No
Would you say that people working in furniture industry in Damietta are friendly?	( )	( )	( )	( )	( )
Would you say that Damietta's furniture industry community looks after one another?	( )	( )	( )	( )	( )
Would you say that people working in furniture industry in Damietta trust one another?	( )	( )	( )	( )	( )

19. **To what extent are these statements true;**
Mark only one oval per row.

	Definitely true	To an Extent	Neutral	I Don't Think So	False
I feel a special sense of belonging with others in the furniture industry in Damietta?	( )	( )	( )	( )	( )
I have an inherent sense of trust in others in the furniture industry, even if I never met them before?	( )	( )	( )	( )	( )
I am proud to be part of the furniture industry profession in Damietta.	( )	( )	( )	( )	( )
To what extent is this statement true: I can trust in my contacts/colleagues' help and support if I need it.	( )	( )	( )	( )	( )

20. **Do you often encounter strangers in the city?**
Mark only one oval.

- ( ) All the time (daily or almost daily)
- ( ) Frequently (3-4 times a week)
- ( ) Sometimes (once a week)
- ( ) Seldom (around once a month)
- ( ) Rarely (almost Never)

21. **How comfortable are you to;**
Mark only one oval per row.

	I do this all the time	When necessary, anyone I know	When necessary, only selective people	I never do this
Ask other business owners for materials/supporting workers when you have a sudden load of work?	◯	◯	◯	◯
Lend other business owners materials/supporting workers when they ask due to a sudden load of work?	◯	◯	◯	◯
Recommend another enterprise that you've previously worked with to a client?	◯	◯	◯	◯
Recommend another enterprise that you never previously worked with to a client?	◯	◯	◯	◯

Norms

22. **Do you have contact with Woodwork Furniture Chamber (WFC)?**
Mark only one oval.

- ◯ Constant contact through business
- ◯ I attend events and Follow Updates
- ◯ I follow through others
- ◯ No contact
- ◯ I didn't know WFC exists

23. **To what extent is this statement true;**
Mark only one oval per row.

	Definitely true	To an Extent	Neutral	I Don't Think So	False
WFC encourages collective identity in Furniture sector in Damietta.	◯	◯	◯	◯	◯

24. **To what extent do you agree with this statement;**
Mark only one oval per row.

	Definitely agree	Somewhat agree	Neutral	I Don't Think So	Definitely Disagree
Furniture enterprises must work together for common interest and growth.	◯	◯	◯	◯	◯

25. **Do you think over the past 5 years, the sense of belonging to the furniture sector in Damietta has gotten better, worse, or stayed about the same?**
Mark only one oval.

- ◯ Gotten Better
- ◯ Gotten Worse
- ◯ Stayed about the same

Networks - Contacts Info

26. **Contact/Owner Name** *

_____

27. **Name of Enterprise** *

_____

28. **Respondent Gender**
Mark only one oval.

⬭ Male

⬭ Female

29. **Please point on the map your enterprise's location (Latitude and Longitude).**

_____

Map of Damietta

30. **What is the contact's role in this enterprise?**
Mark only one oval.

⬭ Sole Owner

⬭ Co-Owner

⬭ Manager

⬭ Employee

⬭ Senior Worker

⬭ Junior Worker

31. **What is the Enterprise's business activity?**
    Tick all that apply.

    ☐ Design

    ☐ Purchasing

    ☐ Inbound logistics

    ☐ Cutting and Carpentry

    ☐ Carving

    ☐ Veneering

    ☐ Finishing (staining, polishing etc.)

    ☐ Upholstery

    ☐ Assembly

    ☐ Testing

    ☐ Value added services

    ☐ Packaging

    ☐ Marketing

    ☐ Distribution and Sales (wholesalers, retailers, contract buyers and showrooms)

    ☐ Transportation

    ☐ After sales support

32. **To what extent is this statement true;**
    Mark only one oval per row.

	Definitely true	To an Extent	Neutral	I Don't Think So	False
I trust this contact.	◯	◯	◯	◯	◯
This contact has a lot of pull in the market.	◯	◯	◯	◯	◯

33. **How frequently do you;**
    Mark only one oval per row.

	Everyday	A few times a week	Once a week	A few times a month	Once a month or less
Work with this contact?	◯	◯	◯	◯	◯
Meet this contact?	◯	◯	◯	◯	◯

34. **To what extent is this statement true;**
    Mark only one oval per row.

	Definitely true	To an Extent	My business is much bigger	Contact's business is much bigger
Me and this contact work on a similar level in the market in Damietta.	◯	◯	◯	◯

35. **This contact works mostly:**
    Mark only one oval.

    ◯ Inside Damietta.

    ◯ Outside Damietta.

    ◯ A little bit of both.

Networks - Last Data

36. **What are the most important sources of market information for you (such as jobs, prices of goods or materials)?**
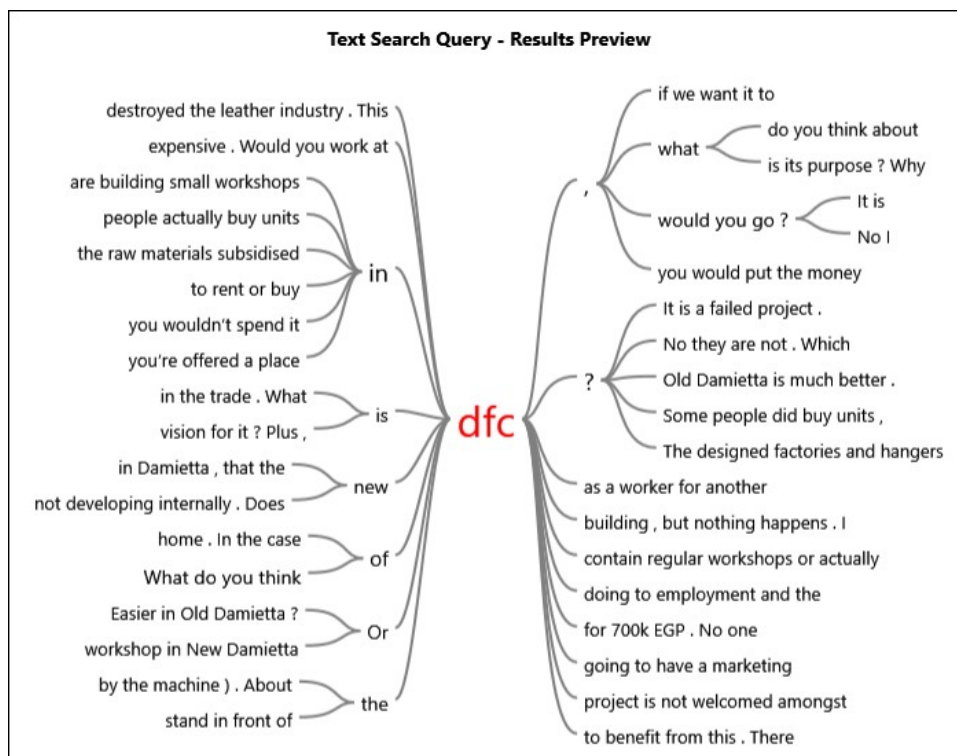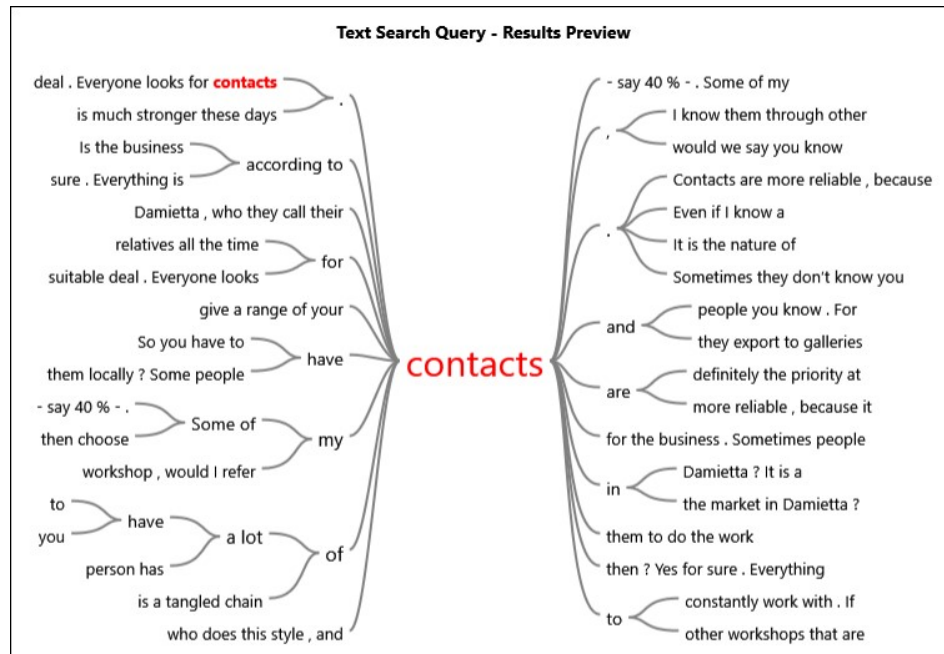
Tick all that apply.

- [ ] Social contacts (relatives, friends and neighbors)
- [ ] Coffeeshop chats (Qahwa)
- [ ] Newspapers
- [ ] Television
- [ ] Radio
- [ ] WFC
- [ ] Business contacts
- [ ] Political associates
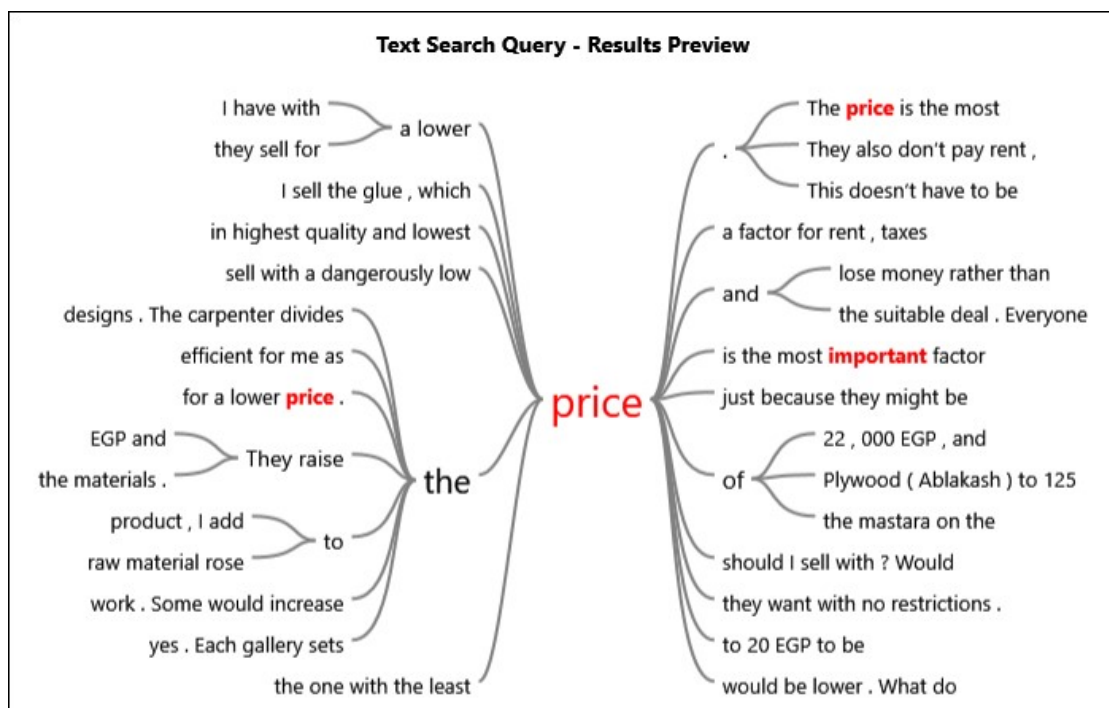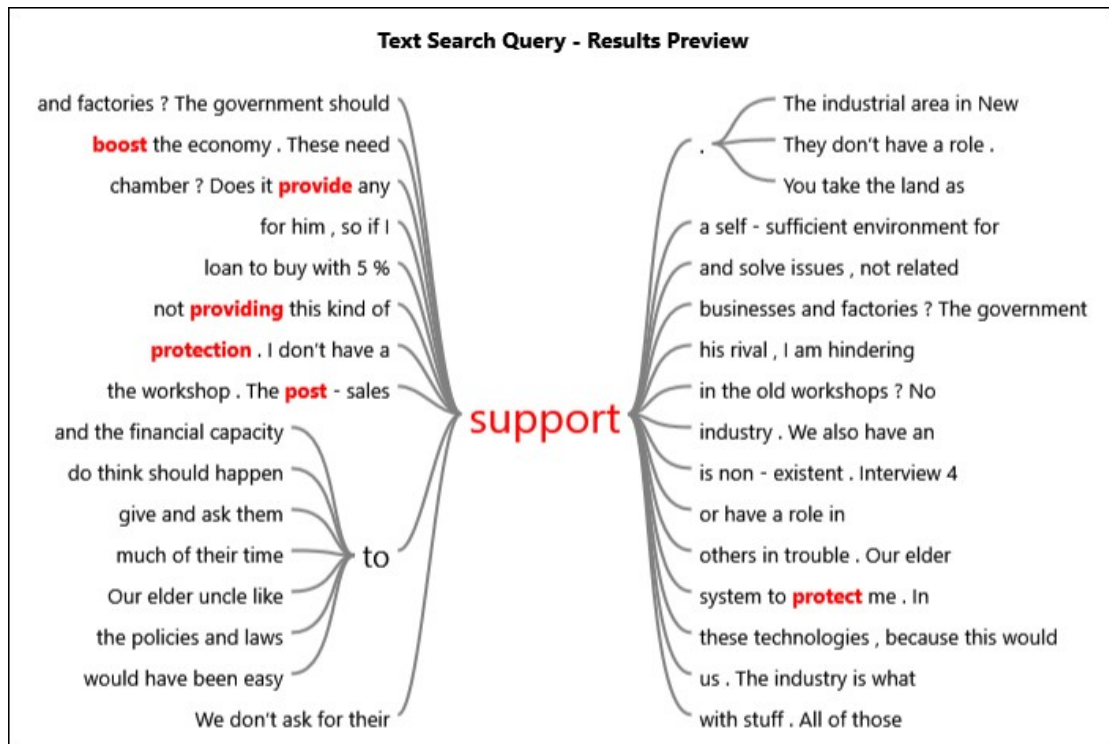- [ ] Relation with government (City Council)
- [ ] Internet

37. **Please rank your contacts from the most essential to your business to the least.**

Mark only one oval per row.

	Most Important to my business	2	3	4	Least Important to my business
Contact 1	◯	◯	◯	◯	◯
Contact 2	◯	◯	◯	◯	◯
Contact 3	◯	◯	◯	◯	◯
Contact 4	◯	◯	◯	◯	◯
Contact 5	◯	◯	◯	◯	◯

Appendix 7. Interview Analysis - Further Diagrams

Text Search Query - Results Preview

Text Search Query - Results Preview

Text Search Query - Results Preview

and factories ? The government should
boost the economy . These need
chamber ? Does it **provide** any
for him , so if I
loan to buy with 5 %
not **providing** this kind of
protection . I don't have a
the workshop . The **post** - sales
and the financial capacity
do think should happen
give and ask them
much of their time
Our elder uncle like
the policies and laws
would have been easy
We don't ask for their

support

to

The industrial area in New
They don't have a role .
You take the land as
a self - sufficient environment for
and solve issues , not related
businesses and factories ? The government
his rival , I am hindering
in the old workshops ? No
industry . We also have an
is non - existent . Interview 4
or have a role in
others in trouble . Our elder
system to **protect** me . In
these technologies , because this would
us . The industry is what
with stuff . All of those

Text Search Query - Results Preview

I have with
they sell for
a lower
I sell the glue , which
in highest quality and lowest
sell with a dangerously low
designs . The carpenter divides
efficient for me as
for a lower **price** .
EGP and
the materials .
They raise
product , I add
raw material rose
to
work . Some would increase
yes . Each gallery sets
the one with the least

the

price

The **price** is the most
They also don't pay rent ,
This doesn't have to be
a factor for rent , taxes
lose money rather than
and
the suitable deal . Everyone
is the most **important** factor
just because they might be
22 , 000 EGP , and
of
Plywood (Ablakash) to 125
the mastara on the
should I sell with ? Would
they want with no restrictions .
to 20 EGP to be
would be lower . What do

Appendix 8. Maps Analysis

This appendix presents a collation of all maps produced by the research in this thesis. This includes GIS secondary data processed in section 6.4, as well as the primary dataset mapping in section 6.6.2 (network mapping and cluster analysis).
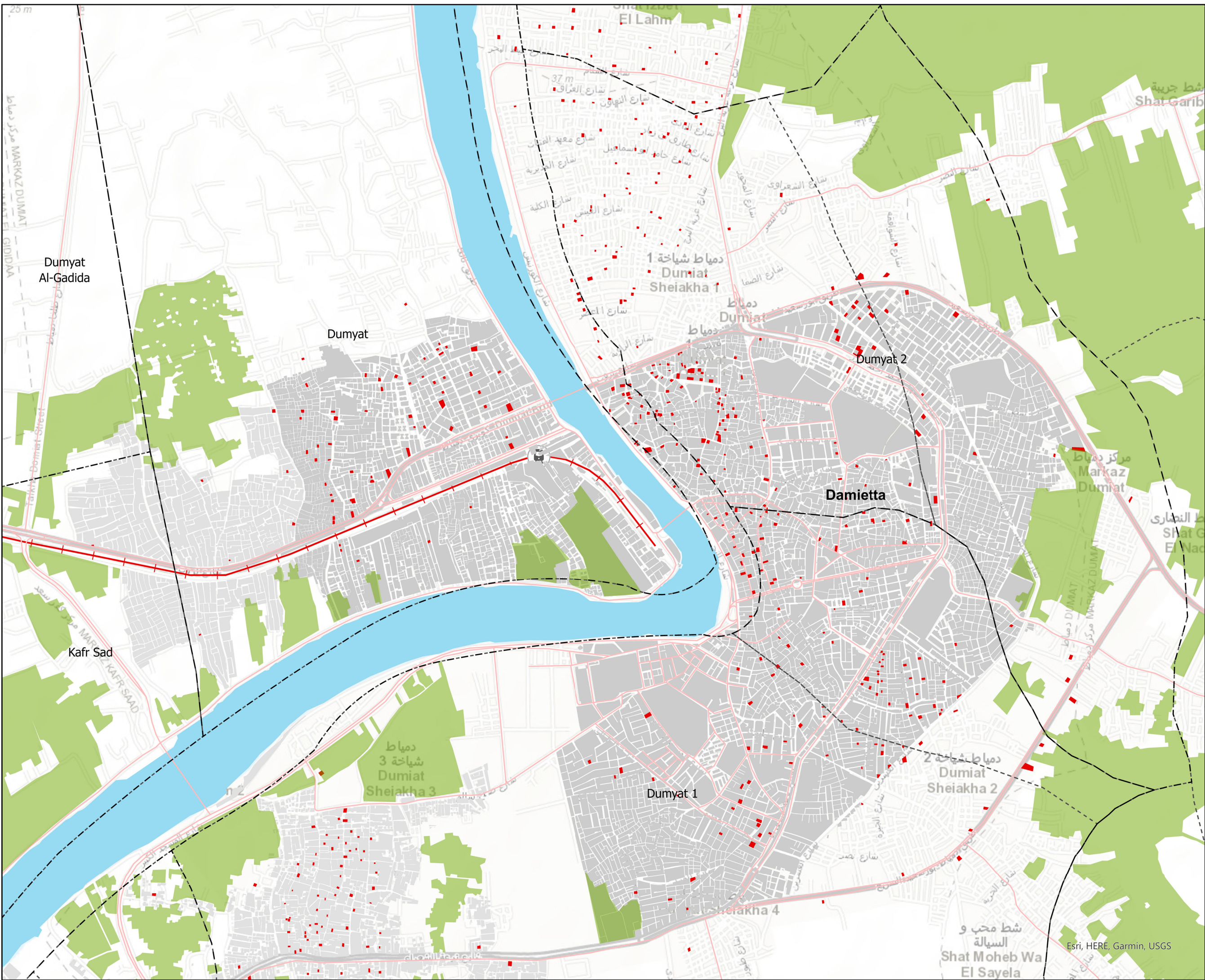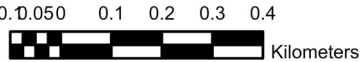
Damietta Base Map

Legend

LocAdded
- ⬜ 0
- 🟥 1
- ⬛ <all other values>

- ▢ Damietta_Admin_Districts
- ▢ Damietta_Admin_Neighbourhood
- 🟩 Agricultural_Land
- ── Damietta_Highways
- ── nile_river
- ── Nile_Damietta
- ── Damietta_natural

Cities_InDamietta
- ✈ hotosm_egy_sea_ports_points
- 🚆 hotosm_egy_railways_points
- ──┼── hotosm_egy_railways_lines
- ▨ hotosm_egy_railways_polygons
- ⬜ Shat_Elsho3ara_current_bldgs
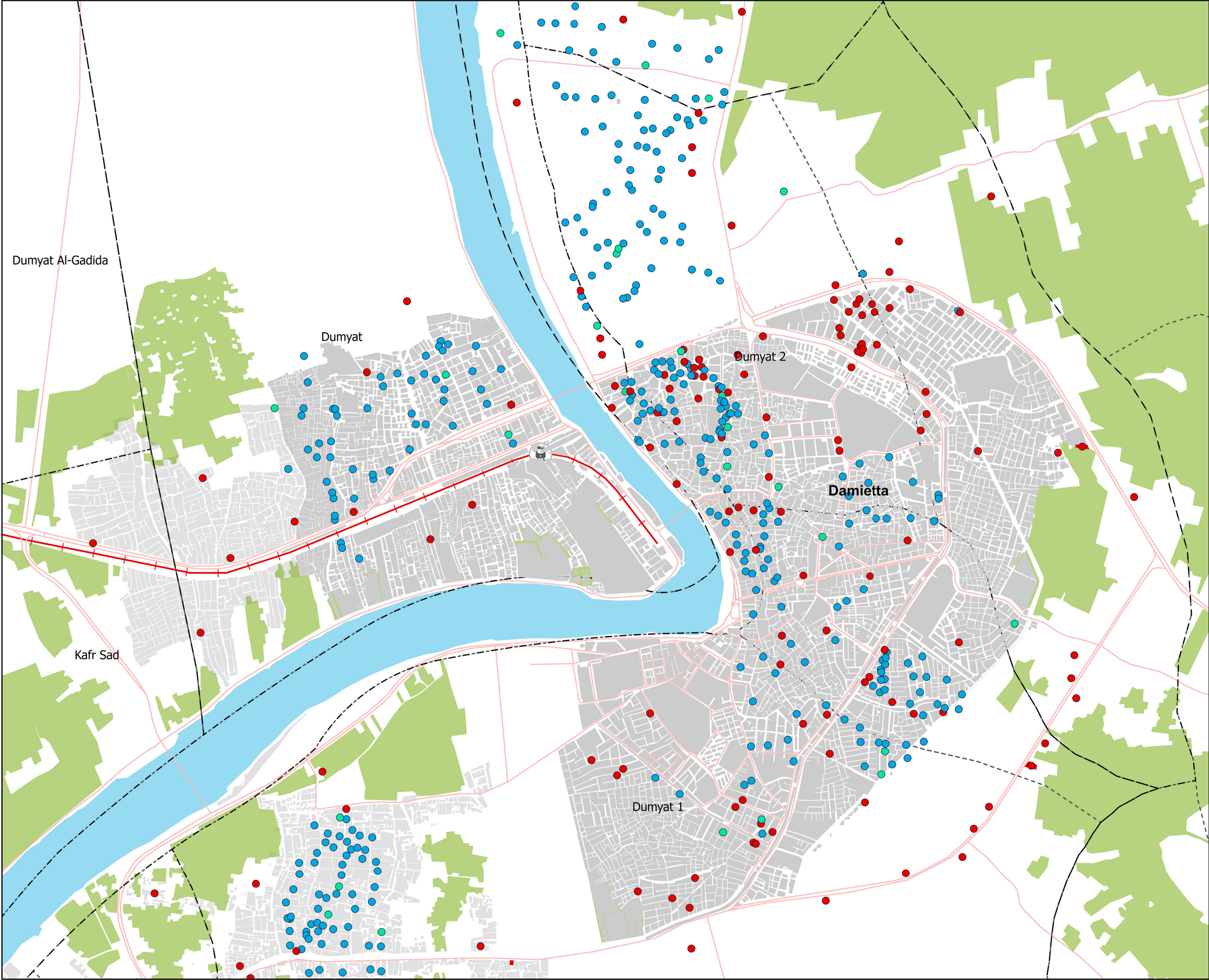- ⬜ Ezab_Alnahda_current_bldgs
- ⬜ Sananeya_current_bldgs
- ⬜ Ananeya_current_blgs

Scale: 1:15,000

N

Please note that some information are available outside the boundaries of this map. This location is based on appropriate data readability and case study base area
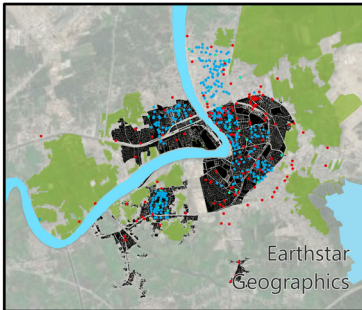
0.1 0.050 0.1 0.2 0.3 0.4
Kilometers

Esri, HERE, Garmin, USGS

Earthstar Geographics
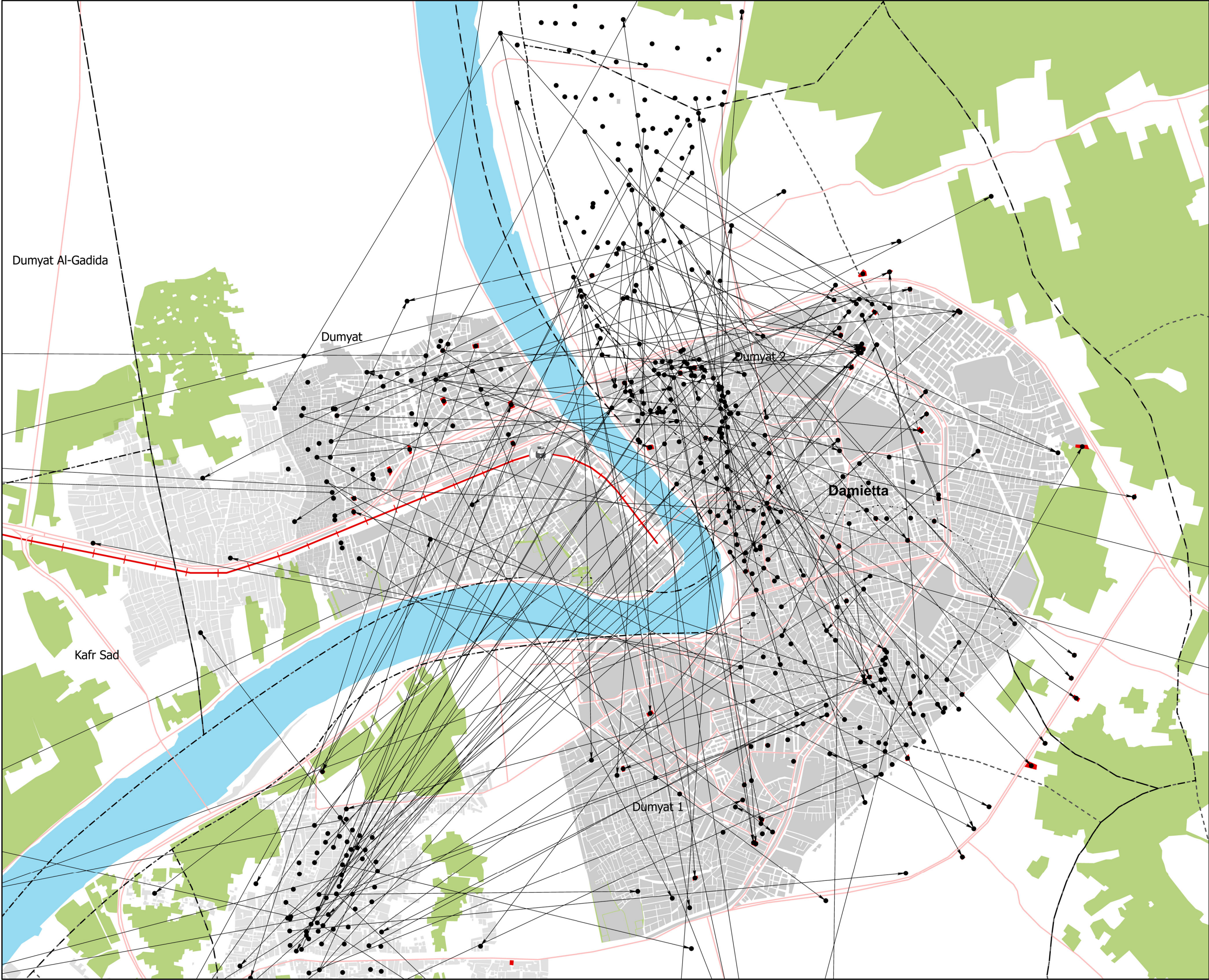
Social Capital Network Mapping

Legend

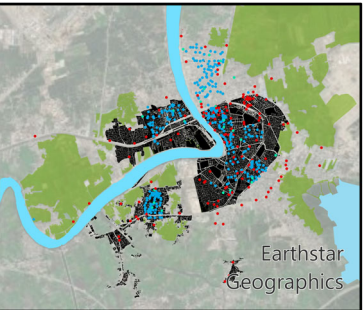**LocAdded**
- • 0
- • 1
- ⦿ <all other values>
- → SNA_Network_XYToLine1

LocAdded
- 0
- 1
- <all other values>

- Damietta_Admin_Districts
- Damietta_Admin_Neighbourhood
- Agricultural_Land
- Damietta_Highways
- nile_river
- Nile_Damietta
- Damietta_natural

Cities_InDamietta
- Agricultural_Land
- Damietta_Highways
- nile_river
- Nile_Damietta
- Damietta_natural

Cities_InDamietta
- ✈ hotosm_egy_sea_ports_points
- 🚌 hotosm_egy_railways_points
- ⊢ hotosm_egy_railways_lines
- hotosm_egy_railways_polygons
- Shat_Elsho3ara_current_bldgs
- Ezab_Alnahda_current_bldgs
- Sananeya_current_bldgs
- Ananeya_current_blgs

Dumyat Al-Gadida

Dumyat

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Earthstar
Geographics

Scale: 1:15,000

N

Please note that some
information are available
outside the boundaries of this
map. This location is based on
appropriate data readability
and case study base area

0.10.050 0.1 0.2 0.3 0.4
Kilometers

Network Users

Legend

PerType
- ● Contact
- ● Survey Respondent
- ● Respondent + Contact
- ● <all other values>

LocAdded
- ▢ 0
- ▮ 1
- ▮ <all other values>
- ─ · Damietta_Admin_Districts
- ─ · · Damietta_Admin_Neighbourhood
- ▬ Agricultural_Land
- ─ Damietta_Highways
- ▬ nile_river
- ▬ Nile_Damietta
- ▬ Damietta_natural
- ▢ Cities_InDamietta
- ▬ Agricultural_Land
- ─ Damietta_Highways
- ▬ nile_river
- ▬ Nile_Damietta
- ▬ Damietta_natural
- ▢ Cities_InDamietta
- ✈ hotosm_egy_sea_ports_points
- 🚂 hotosm_egy_railways_points
- ▬ hotosm_egy_railways_lines
- ▬ hotosm_egy_railways_polygons
- ▢ Shat_Elsho3ara_current_bldgs
- ▢ Ezab_Alnahda_current_bldgs
- ▢ Sananeya_current_bldgs
- ▢ Ananeya_current_blgs

Dumyat Al-Gadida

Dumyat

Kafr Sad

Dumyat 2

Dumyat 1

Damietta

Earthstar Geographics

Scale: 1:15,000

Please note that some information are available outside the boundaries of this map. This location is based on appropriate data readability and case study base area

N

0.0.05 0.1 0.2 0.3 0.4
Kilometers

Social Capital Network Mapping

Dumyat Al-Gadida

Dumyat

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Earthstar Geographics

Scale: 1:15,000

Please note that some information are available outside the boundaries of this map. This location is based on appropriate data readability and case study base area

N

0.10.050 0.1 0.2 0.3 0.4
Kilometers

Dumyat Al-Gadida

Dumyat

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Police Department Port of Damietta

Dumyat

Dumyat Al-Gadida

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Police Department Port of Damietta

Dumyat

Dumyat Al-Gadida

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Police Department Port of Damietta

Dumyat

Dumyat Al-Gadida

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Police Department Port of Damietta

Dumyat Al-Gadida

Dumyat

Dumyat 2

Damietta

Kafr Sad

Dumyat 1

Damietta One

Damietta Two

Central Damietta

![green]	Sheyakha Awal
![teal]	Sheyakha Thany
![yellow]	Sheyakha Thaleth
![blue]	Sheyakha Rabee
![pink]	Senaneya Village

■ Residential - Apartment Building	■ Non-specified Use
■ Residential - Tower	■ Commercial - Kiosk
■ Residential - Villa with one or more units	■ Residential - Tent or temporary unit
■ Residential - Rural house with one or more units	■ Commercial - Fixed cart or display unit
■ Residential - General use	■ Vacant land - Fenced and used
■ Residential - Shaleh	■ Vacant land - Fenced and not used
■ Offices - Workspace with one or more units	■ Vacant land - Not fenced and used
■ Commercial - Mall	■ Vacant land - Cemetery
■ ---	
■ Residential - Floating unit	

0
1-5
6 - 10
11 - 40

■	Before 1944
■	1945 - 1979
■	1980 - 1999
■	2000 - 2009
■	2010 to present

Does not need renovation

Needs minor renovation

Needs medium renovation

Needs major renovation

Cannot be renovated - needs demolishion and rebuild

Commercial
Mixed-use

Trainings and Courses
Nourhan Heysham – PhD Viva Submission

Year 1 (2017-2018)
Academic Trainings

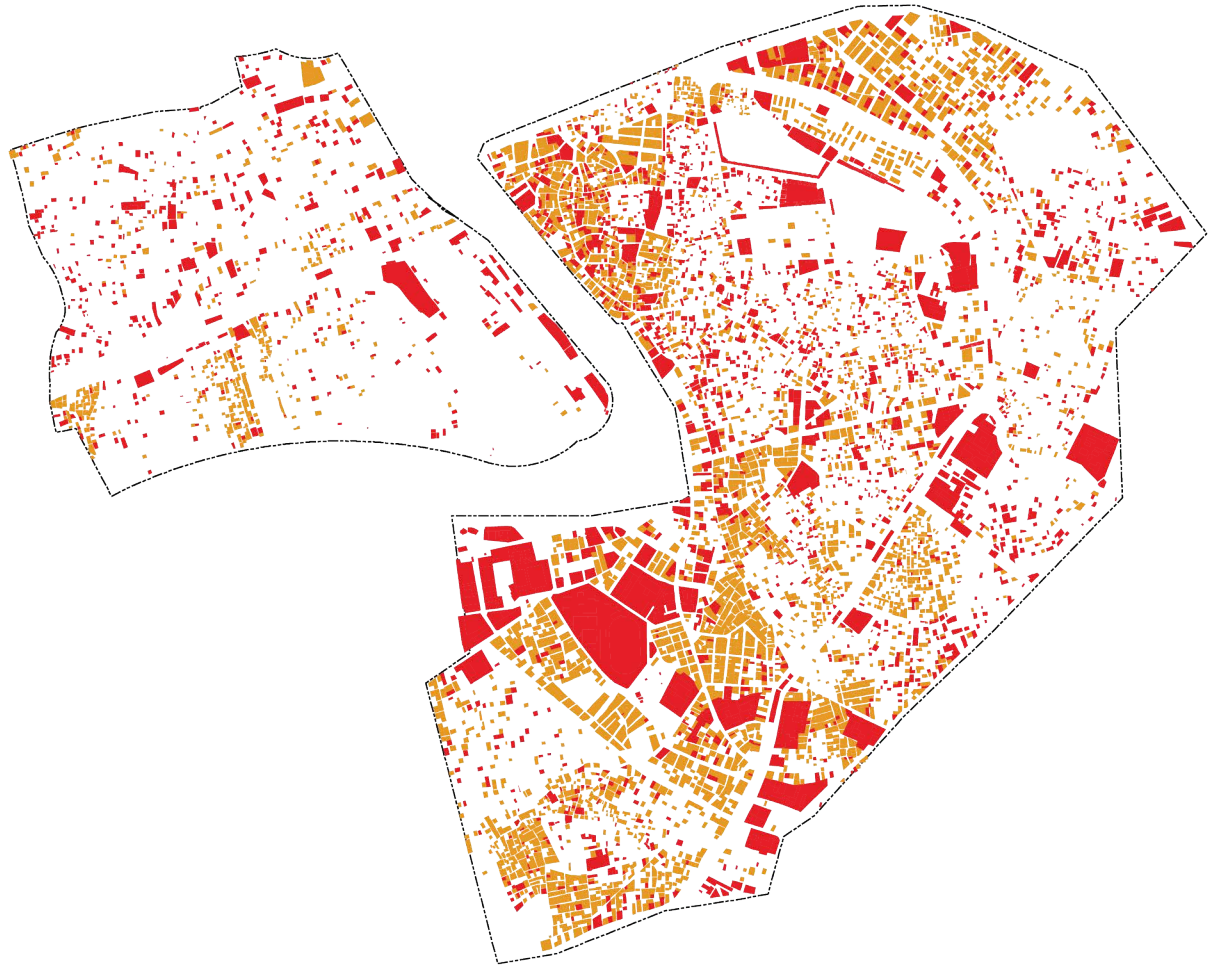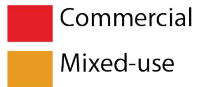| Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
LEAP Higher 1 (Philosophical Stance)	Module	Research Philosophy.	Nov-Dec 2017	6 weeks	Maggie Hardman *LEAP Coordinator / Salford Languages*	ELS, University of Salford
LEAP Higher 2 ((Philosophical Stance)	Module	Research Philosophy.	Feb-Mar 2018	6 weeks	Maggie Hardman *LEAP Coordinator / Salford Languages*	ELS, University of Salford
Electronic Resources for research	Webinar	Finding electronic resources.	15 Nov 2017	1 lecture	Tracy Breheny *Academic Support Librarian*	University of Salford
Mock IE	Lecture	A mock trial for PGR students to review the process of IE exam.	24 Oct 2017	1 lecture	Student presented + 2 examiner professors from SoBE	CIB, University of Salford
How to write a Journal Paper by CIB student Chapter	Lecture	Submitting journal papers.	31 Oct 2017	1 lecture	Mark Shelbourn *SoBE, University of Salford*	CIB, University of Salford
PGR Training Symposium	Symposium	• Your PhD roadmap - planning ahead. • A1: Research / Experimental design planning and methodologies. • B2: Building resilience and bouncebackability. • A3: Get more out of your reading. • A4: The literature review and your critical 'voice'. • B5: Goal setting and staying on track. • A7: Writing like a researcher. • C1: Strategies for managing your literature.	1-3 Oct 2017	3 days	Various lecturers	University of Salford
Advancing interdisciplinary disaster risk reduction	Lecture	Different approaches to interdisciplinary research in disaster risk reduction.	7 Dec 2017	1 lecture	Prof Andrew Collins *Northumbria University*	ThinkLab, SoBE, University of Salford
Disaster Management Conference	Conference	Attended conference on disaster management.	17 Dec 2017	1 day	Various lecturers	University of Salford
Researcher & Research Ethics Induction (for research focused staff and PGRs)	Lecture	Introduction to research Ethics and compliance with University regulations.	7 Feb 2018	1 lecture	Davina Whitnall *Researcher Development Coordinator, University of Salford*	University of Salford

What does it mean managing resilience in an airport?	Lecture	The business continuation management in airports in relation to risk.	16 Mar 2018	1 lecture	Rebecca Carr *Resilience Manager, London City Airport, UK*	ThinkLab, SoBE, University of Salford
Introduction about GIS and remote sensing	Webinar	Introduction of basics of remote sensing and GIS use.	5 Apr 2018	1 lecture	Adeyemi Gideon *Covenant University, Ota, Nigeria*	ThinkLab, SoBE, University of Salford
Mapping and Unmapping the City	Workshop	• Mapping innovative layers of intangible aspects of the city. • Mapping as art and awareness tool for communities. • Individual reflections on mapping and adding personal input into maps.	18 Apr 2018	1 day workshop	Inge Panneels *University of Sunderland / National Glass Centre* Ian Biggs *University of Dundee*	Liverpool School of Architecture. (Gloria Lanci, *University of Liverpool*)
Simulation and Visualisation of direct and indirect impacts of flooding	Lecture	Case studies and methods of simulation and visualisation of flooding.	31 May 2018	1 lecture	Prof Slobodan Djordjevic *Centre for Water Systems, University of Exeter*	ThinkLab, SoBE, University of Salford
Preparing for IA and IE	Lecture	How to prepare for IA and IE assessment.	6 Jun 2018	1 lecture	Jason Underwood *SoBE, University of Salford*	SoBE PGR Research Development
Mock Viva	Lecture	A mock trial for PGR students to review the process of IE exam.	11 Jun 2018	1 lecture	Student presented + 2 examiner professors from SoBE	CIB, University of Salford
Quantitative Research Methods	3 Day Course	Quantitative Methods, Introduction to SPSS and statistical analysis overview.	18-20 Jun 2018	3 Days	Daiga Kamerade & Sara Grace *Directorate of Social Science, School of Health and Society*	School of Health and Society, University of Salford.
Literature for Built Environment Research	Lecture	How to tackle and formulate critical literature review.	20 Jun 2018	1 lecture	Tanja Poppelreuter *SoBE, University of Salford*	SoBE PGR Research Development

MOOCs

Online Courses	Duration	Details / Topics	Date	Affiliation
Rethink the City: New Approaches to Global and Local Urban Challenges	4 weeks	Four main modules: • Spatial Justice. • Housing Provision and Management. • Urban Resilience. • African Urban Challenges.	May 2018	TU Delft – MOOC – Edx.
Specialisation: Geographic Information Systems (GIS)	4 weeks (x5)	Five courses: 1. **Fundamentals of GIS (done).** 2. **GIS Data Formats, Design and Quality (In progress).** 3. Geospatial and Environmental Analysis. 4. Imagery, Automation, and Application. 5. Geospatial Analysis Project.	May 2018 – to present	UC Davis – MOOC – Coursera.

Year 2 (2018-2019)
Academic Trainings

Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
Introduction to Quantitative Research Methodologies	Lecture	Approaches to quantitative methods and statistical analysis.	3 Oct 2018	1 lecture	Dr Anthony Higham	SoBE PGRT
Understanding small areas: spatial analysis of population and neighbourhood data	2-day course	This two-day workshop equips participants with conceptual understanding and technical skills to obtain, analyse and visualise spatial data related to populations and neighbourhoods.	7 and 8 February 2019	2 days	Dr Alan Smith (University of Plymouth) & Dr Andy Newing (University of Leeds)	NCRM (National Centre for Research Methods)
Promoting yourself through networking	Webinar	How to network and market yourself as a researcher	21 March 2019	1 lecture	Sally Beyer (University of Liverpool)	University of Liverpool
CV Support	Session	One-on-one support for CV and career development.	28 March 2019	Session	Lee Houghton	University of Salford
ACP for HEA	Programme	Training for HEA accreditation as AF. Activities included creating 2 online courses for PHD supervision and Research Ethics.	March-June 2019	Course	Davina Whitnall	University of Salford
Research Design	Lecture	Lecture about how to design the research in a comprehensive approach.	3 April 2019	1 lecture	Dr Nick Davis	SoBE PGRT
GIS Data analytics workshop for UK-Russian sustainable cities	Workshop	Understanding and utilising data analytics for developing sustainable cities.	18 – 21 June 2019	4-day workshop	Hisham Elkadi Sara Biscaya	Hisham Elkadi Sara Biscaya

MOOCs

Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
Specialisation: Geographic Information Systems (GIS)	4 weeks (x5)	Five courses: 1. Fundamentals of GIS (done). 2. GIS Data Formats, Design and Quality (In progress). 3. **Geospatial and Environmental Analysis.** 4. Imagery, Automation, and Application. Geospatial Analysis Project.	December 2018 – to present	UC Davis – MOOC – Coursera.	Specialisation: Geographic Information Systems (GIS)	4 weeks (x5)

Year 3 (2019-2020)
Academic Trainings

Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
Mock IA-IE	Lecture	Trial session on how IA and IE examinations are conducted	14 Oct 2019	2 hours	CIB at UoS	CIB Student Chapter
Literature Review	Lecture	How to conduct a critical literature review	15 Oct 2019	2 hours	Dr Tanja Poppelreuter	University of Salford
The Viva	Lecture	How to prepare for your viva	6 Nov 2019	2 hours	Dr Athena Moustaka	University of Salford
Effective Fieldwork	Lecture	How to efficiently execute fieldwork for PhD	4 Dec 2019	2 hours	Prof Will Swan	University of Salford
Advanced Qualitative Research	Lecture	Advanced Qualitative Research	26 Feb 2020	2 hours	Trainer	University of Salford
Web scraping for Social Research	Online training	Web scraping for Social Research	27 Mar 2020	2 hours	Trainer	UK Data Service
Data Management Basics	Online training	Data Management Basics	28 May 2020	2 hours	Trainer	UK Data Service
Quantitative Research Methods	Online training	Quantitative Research Methods	3 Jun 2020	2 hours	Dr Anthony Higham	University of Salford

MOOCs

Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
SPSS for Survey Data Analysis	Online training	SPSS for Survey Data Analysis	23 Jun 2020	2 days	Trainer	CIB at UoS
Summer School: Locative Media for Earthlings in a Changing World	Online workshop	Locative Media for Earthlings in a Changing World	2-16 Jul 2020	15 days	Various	King's College London

Additional Activities

Activity	Type	Affiliation
Research Assistant – IGNITION Project	Full time position	University of Salford
AHRC Research Grant – CHIDE Project	Research funding for Climate Resilience of Damietta's Social Capital Networks.	University of Salford

Year 4 (2020-2021)
Academic Trainings

Training	Type	Details / Topics	Date	Duration	Training done by	Organized by
Mock IA-IE	Online training	Trial session on how IA and IE examinations are conducted	18 Sep 2020	2 hours	CIB at UoS	CIB Student Chapter
Pattern-based Spatial Analysis	Online training	Pattern-based Spatial Analysis	3 Feb 2021	2 hours	Trainer	RGS-IBG
Planning the Post-Pandemic City Series	Webinar	Planning the Post-Pandemic City Series - 'How Estonia is using digital solutions in urban planning during the pandemic and beyond' with Anett Numa (e-Estonia)	3 Feb 2021	1 hour	Anett Numa	QUB
Lecture: Use geography: careers in international development	Webinar	Lecture: Use geography: careers in international development	11 Feb 2021	1 hour	Trainer	RGS-IBG
Arab Land Conference	Online conference	Arab Land Conference	22-24 Feb 2021	2 days	Various	GLTN and UNHABITAT
Lecture: Use geography: careers in mapping, geographical information and data science	Webinar	Lecture: Use geography: careers in mapping, geographical information and data science	10 Mar 2021	1 hour	Trainer	RGS-IBG
GIScience Webinar: GIScience & Network Analysis	Webinar	GIScience Webinar: GIScience & Network Analysis	21 Apr 2021	1 hour	Trainer	RGS-IBG