universität wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

"Urbanising Poverty; Mapping Assemblages and the 'Un-planned' in Jiroft City, Iran."

verfasst von / submitted by

Pouya Sepehr, MA

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Master of Arts (MA)

Wien, 2018

Studienkennzahl lt. Studienblatt / degree programme code as it appears on the student record sheet:	A 066 906
Studienrichtung lt. Studienblatt / degree programme as it appears on the student record sheet:	Masterstudium Science-Technology-Society
Betreut von / Supervisor:	Dr. Erik Aarden

Acknowledgements

I wish to thank various people for their contribution to this thesis; Dr. Erik Aarden for his advice and companionship throughout the development of this thesis. I would always remember our conversations fondly, especially on postcoloniality and the ways in which STS can learn from non-western context. I owe a great appreciation to Mr. Sadri and his team in Sharestan consultancy for their openness to be the subject of the study and hosting the focus group discussion. I also would like to express my deep gratitude to other participants in the focus group discussion who gave me their valuable time and made this research aware of realities regarding their work. This research, I hope, would contribute to the crucial and complicated urban planning practices particularly for regeneration purposes.

Special thanks should be given to Mona for her kindness and encouragement to help me start a new life. I should also thank Sara and Cornelius for helping me with proofreading and translation to German. Writing in another language is always a challenging task and a learning process.

Last but not the least, if there is any pride in this research, I should dedicate it to my mother Afsaneh and to my aunt Roya for their unconventional support and love not just for my studies but throughout my life. I feel privileged to have such strong women in my life as a role model.

Abstract

This research investigates in assemblages of urban poverty in a regeneration programme in Iran. The study shows that mapping in regeneration programme leads to constellations of poverty as an urban matter– that is what I call 'urbanising poverty'. Empirically this research gathers a group of experts from an urban consulting company, governmental authorities, NGOs and academics together to discuss the effects and practices of mapping. Situating the theoretical framework within STS and urban studies, this research applies assemblage thinking and actor-network theory to find out in what ways mapping reflects and produces assemblages of urban poverty in the case of Jiroft regeneration programme. The study shows how mapping increases the visibility of poverty for government officials. This fundamentally alters the perspective of the space when observed from the vantage point of planning and the purpose of regeneration. Mapping, though, is not just a knowledge-making practice that associates socio-material elements with one another, but it creates new meanings. I argue that maps not only create knowledge about the place but also make new realities and form new networks. In other word, planners in action make and define urban poverty. Further development in this project may empirically look at how mapping changes the reality of the place after the map is made and travelled into the hands of local authorities and the people as map users.

Abstract (Deutsch)

Dieses Forschungsprojekt befasst sich mit *assemblages* urbaner Armut in einem Iranischen Stadterneuerungsprogramm. Die Arbeit erörtert, wie Kartierungspraxis innerhalb des Programms, Armutskonstellationen als einen urbanen Sachverhalt darstellen—einen Prozess den ich als, 'urbansing poverty' bezeichne. Der empirische Teil der Arbeit versammelt ExpertInnen einer Beratungsfirma, staatlicher Behörden, aus NGOs und dem akademischen Sektor, um Auswirkungen und Praktiken von Kartierung zu diskutieren. Basierend auf Konzepten der *Science and Technology Studies* (STS) und der Urbanistik, wendet diese Arbeit *assemblage thinking* und Akteur-Netzwerk Theorie an, um zu untersuchen inwiefern Kartierung innerhalb des Jiroft Stadterneuerungsprogramms *assemblages* urbaner Armut reflektiert und produziert. Es wird gezeigt wie Kartierung die Sichtbarkeit von Armut für staatliche Behörden erhöht. Dieses Ergebnis verweist auf eine grundlegend veränderte Räumlichkeit aus Perspektive der städtischen Planung und vor dem Hintergrund der städtischen Erneuerung. Kartierung ist somit nicht ausschließlich eine Praxis der Wissensproduktion, die sozio-materielle Elemente verbindet, sondern schafft neue Bedeutungen. Des Weiteren argumentiere ich, dass Karten nicht nur lediglich dazu beitragen Wissen über Raum schaffen, sondern auch neue Realitäten und Netzwerke. Mit anderen Worte, aktive Stadtplanung schafft und definiert städtische Armut. Für weiterführende Forschung wirkt es ratsam, zu untersuchen wie fertige Karten die Realität von Raum verändern, wenn sie beispielsweise in die Hände lokaler Behörden und anderer NutzerInnen gelangen.

Contents

List of Figures

List of abbreviations

ANT	Actor Network Theory
GIS	Geographical Information System
MRUD	Ministry of Roads and Urban Development
URDO	Urban Development and Revitalization Organisation
SA	Situational Analysis
SCOT	Social Construction of Technology
STS	Science and Technology Studies
ToR	Terms of Reference
UPE	Urban Political Ecology
OPP	Obligatory Passage Point
FGD	Focus Group Discussion
IS	Informal Settlements

Chapter 1 Introduction

Every research, book, project, movement and action starts with an interest, an initial motive and inspiration. This research project is partially inspired by my previous working experience in urban regeneration planning for informal settlements in Iran. Having studied science and technology studies (STS) and the ways in which STS critically examines the role of expertise and knowledge-making, I thought of reflecting on my previous experience in urban development projects employing an STS lens. As the title suggests: "Urbanising Poverty: Mapping Assemblages and the Unplanned" I primary have two main notions involved in the research – “mapping” and the “unplanned.” The former, refers to mapmaking as a device for geographical and specifically urban geography knowledge-making; and the latter points to two things at the same time: a type of urban place and an absence of planning. Nevertheless, this study shows how a set of practices by urban planners under a regeneration planning scheme in Iran, results in assembling urban poverty by the means of mapping and planning. That is what I call the process of urbanising poverty.

Initiatives to combat poverty and find ways to improve impoverished neighbourhoods in rapidly growing cities have become a major concern for governments the world over. Almost every country has different ways to broach the issue, yet the ways in which we make knowledge about poverty remains an ongoing research enquiry. The making of poverty as an urban issue is related to how we know about poverty and where it is located according to the maps planners produce. This has a direct effect on how we make decisions about what to do about it; not just as a space or a place but for those who live there. Thus, this research seeks to find out the making of urban poverty knowledge and the ways in which it is practiced and reflected based on an example from Iran.

In this thesis I builds the hypothesis on the recent debates on “STS and the City” literature. In this vein, I examine how major contributors in both fields, STS and urban studies, have raised questions concerning the city. In so doing, I will explore how STS, with its rich conceptual frameworks, as a method come to analyse and describe sociotechnical assemblages of cities and their effects on contemporary urban societies. Recently, in the fourth edition of the *Handbook of Science and Technology Studies*, Farías and Blok

(2017) provide a genealogy of STS and the City scholarships by reviewing the borrowings and travelings between STS and urban studies as highly interdisciplinary and heterogeneous fields. This study follows their mapping of literature and development of concepts in STS and the City scholarship. Generally, the authors explore two types of arrangement: first, the city as a fascinating site (or sites) of technoscience interaction with politics and society; and second, the ways in which STS conceptual repertoires are increasingly being used to explore urban questions (p. 555). I take an exploratory journey in both realms.

Empirically, however, this study specifically focuses on the regeneration planning programme in Jiroft City. Then I apply STS conceptual repertoires to find out how maps as devices of planning play a role in reassembling urban poverty. The analysis of the role of mapping in this study is viewed through the lens of "translation of realities" and the hybrid approach of "actor-network theory" (ANT) (Callon 1986; Latour 1987; 2005; Law 2009).

Mapping, in the context of regeneration planning, has major effect on: first indicating what and where are the informal settlements (as a form of unplanned areas or urban poor areas); and then opens up space for negotiations for taking actions and planning for change; and finally, those agreed plans supposedly lead to spatial improvement of such areas as well as empowerment of the communities of social groups. How the map is made therefore has great consequences for how it is used and how it presents the reality of the place and the people who live there.

Mapmaking is a crucial planning device. From an ANT standpoint, mapping as a device consists of a web of different materials and social relations that together make mapping possible. Then, the map as a product of that process creates a space for new networks to emerge and involve other actors in line with the purpose the pursues. Mapping, though, is not just a knowledge making practice that associates socio-material elements with one another, but it has (and creates) new meanings. Therefore, on the one hand, a map is a central node in the network, one that 'translates' the city into a two-dimensional format for which plans can be made. On the other hand, the map not only is a node, but what ANT theorists (Callon, 1986; Law, 2009) call an '*obligatory passage point*': all actors involved should relate to the map in order to plan and make decisions regarding urban poverty.

Hence, in this study, I will try to analyse mapping as a crucial instrument for regeneration planning projects in Iran and the ways in which mapping produces and reflects assemblages of urban poverty. This research takes a critical view on the making of maps

from an STS point of view in the regeneration planning programme for informal settlements of Jiroft City in Iran.

1.1 Urban poverty as an STS enquiry

Almost 60 percent of the world's population lives in an urban environment and the percentage is growing at a fast pace. This time of rapid urbanisation calls for more debates on the new emerging societal dynamics that come of it. A major portion of new-comers to cities are from impoverished rural communities that have no choice but to seek new opportunities in cities. Their first experience of the city is usually in ever-expanding slums and informal settlements. Mike Davis (2006), in an alarming statement, envisions future cities as: "…[T]hus, the cities of the future, rather than being made out of glass and steel as envisioned by earlier generations of urbanists, are instead largely constructed out of crude brick, straw, recycled plastic, cement blocks, and scrap wood. Instead of cities of light soaring toward heaven, much of the twenty-first-century urban world squats in squalor, surrounded by pollution, excrement, and decay." (Davis 2007, p. 19. original emphasis). Beyond providing vivid imagery of so-called "planet of slums", STS programmes could contribute theoretically and epistemologically in the ways in which assemblages of urban poverty are framed and understood. In fact, unplanned places are sites of research where STS enterprise can find new spaces of exchange and exploration.

Farías and Blok (2017) in a final remark on the genealogy of the "STS and the City" debate, invite researchers for more contribution on: first, the problem of urban difference especially from a post-colonial perspective but not limited to colonial relation discourses of cities; second, the performativity of STS vis-à-vis the formation of urban knowledges, including urban professions of architecture, design and planning (p.575). In this realm, the question of urban poverty as a city within the city, and the ways in which such sociospatial realities are translated into urban knowledges remains an interesting research enquiry, which has not been the focus of many studies in STS. In this respect, the different worlds of urban knowledge and practice are the object of STS enquiry, especially with regard to the conceptual and methodological strengths of STS and the rich empirical sites of the city. Particularly, ANT-informed studies have shown the entanglement of knowledge, material entities and expertise practices which together (re)assemble a new knowledge of place and societal issues in an organised, routinized and managed way.

1.1.1 STS and the City debate

Farías and Blok (2017) describe three avenues of STS in the city that distinctively examine different agendas and academic disciplines. In the first avenue, science and technolo-

gy in the city is yet another socio-political practice that exercises power. In this view, experts compete on their visions and the knowledge they produce to make decisions and influence implementation through artefacts that have politics (Woolgar and Cooper 1999). In a similar context, other studies have applied well-established STS approaches in the SCOT tradition to analyse the city as a technological artefact (Aibar and Bijker 1997; Hommels 2005). In the second avenue, the authors point to STS scholars' discovery of the urban-built environment as an entanglement of natural and urban processes. Metabolism and the urban politics of natures were in the core enquiry of research that led to so-called Urban Political Ecology (UPE), which distinguishes the city as a complex infrastructural and sociotechnical apparatus consisting of fluctuating human and non-human interaction. In this tradition, the competing knowledge-making processes led by experts come to the focus of study that is traced back to STS and laboratory studies to a newly established studio studies (Farías and Wilkie 2015) which explore how architects and urban planners make the knowledge of the city that shapes the urban environment today.

In the third avenue, the conceptual repertoires of ANT and Deleuzian philosophy come to initiate a novel approach known as "assemblage urbanism" or "urban assemblages" (e.g., Farías and Bender 2009; McFarlane 2011a). Assemblage thinking, seeks to reconstitute the ontology and politics of cities from relational and post-representational approaches. This has a strong root in ANT–consonant principles of symmetry, flatness, and multiplicity. Farías and Blok (2017) describe assemblage urbanism as an approach in which "the city is cast not primarily as a novel site in which to study science and technology or as confronting STS scholars with new difficult artefacts, such as buildings. Rather, what is at stake is the extent to which it is necessary to recast and reassemble the very object of urban studies: the city" (p.569).

In this strand of STS-informed scholarship, Bruno Latour and photographer Emilie Hermant's (1998) inaugural work is so crucial. Their book-website focuses on different urban sites that makes the city function through material practice, embodied circulation, and infrastructural maintenance and coordination (Farías and Blok, p.569) in Paris. Another early contribution in this realm is Ola Söderström (1996) study of visualisation techniques in the history of urban planning (p.570). Various developments in studies of urban assemblages, Farías and Blok state: "supports Latour's key claim that there is not one Paris, but multiple Parises; that is, that the city needs to be understood as a multiplicity that is simply impossible to totalise or to fix" (p.570). However more than anything, debate around the assemblages of the city is about the politics of urban knowledge-making (p.572), through the relational understanding of actor-networks that are based

on shared concerns and power relations. In the end, the urban assemblage debate since 2011 has unfolded primarily in the journal *City*, to which I will pay a close attention later in the state of the art chapter. In this riveting debate, Farías and Blok (2017) state: "[…] it gives us clues to how ANT and STS insights and analytical tensions are currently travelling across academic fields of enquiry, being taken into account, transformed, and contested" (p.572).

In short, this thesis builds upon the third avenue and applies assemblage thinking as a theoretical lens, but focuses on the role of experts in making urban poverty visible, and through mapping practices as a crucial device of planning. In this study, ANT, as a methodological approach, is used to explore assemblages of urban poverty in regeneration planning projects in Iran. Assemblages of urban poverty, from urban planners point of view, as the city experts, contradicts with the nature of informal settlements, which are inherently 'unplanned' and not in the 'territorial assemblages' of the city management. Therefore, the ways in which urban planners translate such places into socio-spatial realities reflects how the knowledge is produced and how it gets institutionalised by officials. Mappings and maps as crucial devices of planning reflect the entire process of planning in which all the actors involved will relate to. Ultimately, mapmaking to imply that the final things on the map are the culmination of an implied process by selecting specific choices. Mapping is a projection of actor-networks in cities that has specific purpose to pursue.

1.2 Urban poverty in Iran

In a globalised and fast-changing environment, Iran's urbanisation has its own stories. Iran's population in the 1950's was less than 20 million with 30 percent living in urban areas. The discovery of vast oil and gas resources in the country led to rapid urbanisation, including the development of many roads and infrastructure. This greatly contributed to the emergence of a large urban population. According to national statistical data, Iran's population had gone from 38 Million in 1980 to 56 million in 1990 and today it is above 80 million. According to Iran's statistical centre, in 1986 the urban-rural ratio went from 40 percentage to 60. It changed to 65 to 35 percentage in 2011 and the latest survey shows the urban population is 73.4 percentage of the total population. Tehran is Iran's capital and the largest city which has an urban area of 8.7 million inhabitants and 12 million in the wider metropolitan area. Since the time of modernisation, Tehran has experienced a mass migration of people from all around Iran (Alaedini, 2015). An almost similar pattern of urbanisation has happened in other major cities in Iran such as Isfahan, Mashhad, Tabriz, Shiraz and Kerman, albeit, with a less dramatic change. These cities

with populations of more than one million, are the main destination for migrants who seek out economic opportunities. However, smaller cities play a similar role for villages and rural areas around them. At early stages of the demographic shift, a sharp rise in demand for housing and services occurs leaving a complex situation for any government to handle. Here, one can see how architects, urban planners and development agencies have a role in making and dealing with these challenges.

In this environment, supply for urban housing is low while demand is high leading to improvised housing within the city and in the margins. Informal settlement is a label for non-planned areas that came into being in the past 40 years of urban development in Iran. According to the Ministry of Road and Urban Development, twenty percent of the urban population in Iran live in such conditions, and are mainly located in the margin of cities (Alaedini, 2015). The government's effort to organise informal settlements goes back to 1997 when the World Bank initiated a few research projects to study urban poverty conditions in Iran. This led to different planning programmes for Iranian urban fabrics. Although the World Bank's presence did not last longer than five years, the projects, were continued under the guidance of the Iranian Ministry of Road and Urban Development. Since then, numerous studies and planning activities have been conducted in different cities around the country.

1.2.1 Urban regeneration programmes in Iran

The official office for urban poverty affairs in Iran is the Urban Development and Revitalization Organization (UDRO) of the Iranian Ministry of Roads and Urban Development (MRUD). The UDRO was established as a collaboration between the World Bank and the MRUD back in the late 1990's.[1] According to the limited information available on UDRO's website, the organization was established based on the stipulation of the then presidential cabinet in 1997 and started to operate at the regional and national levels since July 2004. The main role of the organization is to take the leading role in organizing the government's undertakings through its subsidiary companies. The main activities of UDRO focuses on urban revitalization, rehabilitation, and renovation for the impoverished urban fabrics such as decade areas, abandoned old areas and informal settlements. UDRO mobilises resources by means of developing facilities and enhancement of urban living environment within the framework of the policies of MRUD. Above all, the organisation provides a platform for engagement of different

1 Retrieved from UDRO website. The date is not exact since the data on the web does not refer to an exact date but mentions duration of 20 years.

actors in the process and emphasises the key role networking plays in regeneration programmes.

Regeneration programmes, by definition, are set of activities and policies for achieving the UDRO's agenda.[2] Even in the short history of the UDRO, different terms, notions and concepts have been the focus and the framework of their programmes, which is an interesting subject of study in itself. With regards to this research, 'regeneration' refers to a set of plans and programmes in which the target urban fabrics (including informal settlements) are first identified and prioritised for planning based on socio-economic, spatial and environmental criteria. Secondly, communities' needs identification of the areas that are studied according to city official documents and local authorities' knowledge and information. Thirdly, predicaments are identified in participation with local communities and active groups (religious groups, NGOs, etc.); fourth, reorganisation plans and redevelopment plans are designed based on future vision and the predicaments; fifth and finally, empowerment programmes are made for both city management authorities and the local communities in collaboration with active groups[3].

1.3 The research question and the site

Nevertheless, the research enquiry is to explore assemblages of the socio-material and situated practice of planning in the making of urban poverty through maps as a technical and political project of poverty eradication under regeneration programmes in Iran. I am adopting assemblage thinking, rather, urban assemblages as an innovative approach in the intersection of STS and urban studies to examine how such theoretical frameworks help to understand planning processes for urban poor areas within the case study I have chosen for this research. The research, therefore, asks: **how does mapping reflect and produce assemblages of urban poverty in the context of regeneration planning in Iran?** Mapmaking as a process and planning as a practice are multi-dimensional and complex topics. However, at the empirical level, I will elaborate in detail how mapmaking and planning intersect in this study and what does it mean in this context through the case study of the Jiroft regeneration project. In short, this study empirically aims at analysing maps and mapping practices through two main groups of actors: consulting companies and governmental authorities in a focus group setting to explore the mapping process, its meanings, its purposes and the ways in which it is produced and reflects realities of urban poverty.

2 Retrieved from UDRO website: www.udrc.ir

3 Retrieved from UDRO contract template for regeneration programmes

In so doing, I initially define the situation by determining what/who the actors/actants are in this context. The thesis, then, empirically asks: **Who are making the maps, and how? What is the purpose of the map? Why is it made?** These guiding questions will lay out key actor-networks and the relationships between other elements in the network. In the next phase the research delves into specificities of the knowledge-making process by trying to find out: **How do maps present and make knowledge of urban poverty in Jiroft? What do/do not maps show and say?** This question relates to the translation of realities, details, and facts on a map into a form of data. This data in turn generates new forms of knowledge that inform decision making and planning.

1.3.1 Introducing the case study

The case study that I have investigated is about regeneration programmes for informal settlements (IS) for Jiroft City in Iran. The city is in south-eastern Iran at the junction of two main transit roads; one road leads to the country's southern harbours on the Sea of Oman. The other road leads to Baluchistan, a province that shares a border with Pakistan. Known for its dates and citrus, Jiroft's valley is a huge agricultural hub that exports its produce as far as neighboring countries on the southern side of the Persian Gulf. According to the Jiroft Municipality experts, the city has a population of around 109,000 inhabitants and supposedly 20,000 unregistered migrants. The unregistered migrants are Afghanis and Pakistanis who illegally cross the border to work in farms and gardens in and around Jiroft.

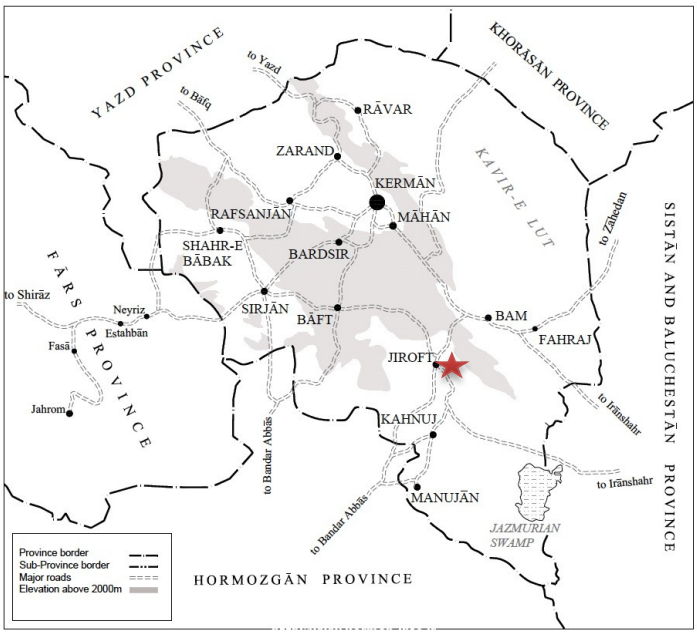


Figure 1: The Map of Jiroft region

The Jiroft regeneration project was funded by UDRO. Sharestan consultants conducted the regeneration planning programme during 2014 and 2015. The province decision-making committee approved the final reports and plans in 2016. The regeneration planning programme identifies five neighbourhoods as informal settlements, with a population of over 17,000 people in an area equal to one fifth of the city. The final reports come in seven volumes in which different aspects of the city are analysed in relation to the scope and the typology of poverty in the city. One volume, entitled 'the map album,' consists of 104 maps. Each map represents a specific aspect of the planning process while simultaneously creating knowledge of the situation.

As part of my research, I conducted a focus group discussion (FGD) in March 2017, where I invited seven experts who either had a hand in the Jiroft regeneration project or had experience in working on similar projects. A selection of the most important maps were selected for discussion during the FGD. Findings of this thesis reflect discussions from the FGD as well as analysis of the Terms of Reference (ToR) as the main guideline for the Jiroft regeneration project.

1.3.2 Research material and analysis method

The aim of the focus group discussion was to set up a space for debate and discussion with different experts involved in the regeneration planning process of Jiroft City. The dynamic of the group and the participants were a very important element in gathering the data for this research, which has a direct impact on the way in which this research was designed. The prompt for the FGD included the following questions: What is a map? How does it produce knowledge? What is the purpose of the map? What is the relation of the map and planning practices? How does mapping play a role in urban regeneration projects for informal settlements? Who are the actors involved in the process? How the map gets produced and produces effects?

Seven experts participated in the FGD. Three of the participants were from Sharestan Consultancy Firm including CEO, Sadri, and two of the planners (Pedram and Meisam) who worked on Jiroft's regeneration project. The lead UDRO expert, Kamal, also attended the discussion. He oversaw the coordination among the consultants, the local authorities and the ministry, as well as approved the Jiroft regeneration project before presenting it to the high-level policy committee. He represented the central government in the process of IS regeneration planning. Another participant, Mehrnaz, who works at UDRO at the office for research and publication, also took part. She is an active member of SOSA Poverty, an NGO working against child labour and poverty in Iran. She saw things from the vantage point of NGOs in regeneration processes and the

ways in which maps and mapping come to play a role for NGOs working with communities in such neighbourhoods. The two other participants Kaveh and Payam, each have a strong background in academia and urban sociology. Kaveh, is the head of the faculty of architecture and urban studies at Azad University, and Payam is an urban sociologist and economist with nearly two decades of experience of working in the field of urban poverty. He oversaw sociological studies of the Jiroft project at the time. Both scholars have influential articles in this field and came to view regeneration projects and mapping from a critical point.

The method applied for the analysis is Situational Analysis (SA) guided by Adele Clarke and others (2005; 2015). SA and its mapping techniques, which also relates to the subject of this study, helped me to identify actors, actants and different elements involved in the research enquiry in relation to one another and to the broader network. In analysing the data from the FGD, I first map out the actor-networks to show how mapping is done in this context and what is the purposes behind it. Then the next step was to analyse the nature of relations that hold actors together or keep them away from each other. Subsequently, I address each research question in the situation of enquiry by examining how it's perceived within the actor-network.

Initially developed by Glaser and Strauss and later by others, "situational analysis" is rather an innovative take on grounded theory (Clarke 2005; 2015). Grounded theory is a method for systematically analysing qualitative data to elucidate the key forms of action undertaken by participants in a particular situation (Clarke and Friese 2010, p.363). Key notions in grounded theory are rooted in poststructuralism in social sciences after the postmodern turn (p.363), particularly empirically oriented studies. As such, this approach tries to address concerns with difference, reflexivity, relationality, positionality and more recently performativity and situatedness in every instance of knowledge making (p. 363). Consequently, situational analysis (Clarke and Friese 2010) brings a shift in Strauss' framework on the notion of social worlds and arenas. These notions introduce what he calls meso-social, in between individual (micro level) and social (macro level), which are often hidden infrastructures through which negotiations are organised. Social worlds, as such, are various groups and people who make commitment to take actions and change the situation that they are involved with (p.364). Social worlds are constellations of people and actions in a situation that defines their relations to one another and to the actions they take or do not take.

In sharp contrast, situational analysis defines the conditions of the situation in the situation per se (p. 364). Situation is the key and the elements or the components of the situa-

tion are constitutive of it. Therefore, what structures and conditions any situation is an empirical set of questions (p.364). Hence, the fundamental question in doing situational analysis is 'How do these conditions appear, make themselves felt as consequential, inside the empirical situation under examination?' (p.364). In defining the situation and analysing the conditions and components of it, Clarke (2003; 2005; 2015) offers three main cartographic analytical approaches:

1. Situational maps which lay out the major human, nonhuman, discursive, and other elements in the research situation of concern and provoke analysis of relations among them;

2. Social worlds/arenas maps which lay out the collective actors, key nonhuman elements, and the arenas of commitment within which they are engaged in ongoing negotiations, mesolevel interpretations of the situation; and

3. Positional maps which lay out the major positions, taken, and not taken, in the data vis-à-vis particular axes of variation and difference, concern, and controversy around issues found in the situation of enquiry.

The mapping techniques as for analysis method not only offered me a way to make sense of the situation of enquiry and conduct my research, but it also involved me as the researcher in the very practice of mapping in the study of maps. In fact, such speculation would broaden my engagement with mapping and performing analysis at the same time. For the scale of enquiry of this research I only used situational maps and relational maps which I will reflect on the experiment later.

Clarke (2005) also states that "it is important to note in making situational maps that the maps produced are not necessarily intended to form final analytic products. They are meant to open up the data, stimulate thinking, generate codes, make memos based on analytical work and recognise sites of silence." (pp. 108-109) This project is aiming to use this methodological approach as it covers best the multi-dimensional nature of the research site and the topic. The central situation in this project is mapping in urban regeneration planning in Iran. Other elements such as maps, policies, contracts, ToRs, meetings, decisions, justifications and so on and so forth in combinations with different groups of actors are all connecting in different ways. This interaction and relational positioning of the situation is thus the focus of the project in addressing the research questions.

Last but not least, maps as an object in regeneration planning and as a final product in the process of mapmaking are also subject of analysis in this research. In so doing, I refer to various ways to analyse maps from theoretical point of view. I will present what maps show and don't show in the Jiroft project referring to the experiment conducted during the FGD with the participants.

1.4 Thesis structure

This research is organised in six chapters. After the introduction, chapter two focuses on various ways STS and urban studies collide and interact in the academic world. I also review travelings of different concepts and notions in between the two highly interdisciplinary fields of STS and urban studies. Throughout the chapter, I emphasise how ANT and urban assemblages have received tremendous attention in urban studies, in which this research situates its inquiries. Chapter three shifts the focus of the study to more specific topics and explores mappings from theoretical and methodological perspectives. Meanwhile, chapter three presents the context of the study and shows how mapping and planning are interconnected as both come to be practices of knowledge making and imagining the future of places.

Chapter four starts by elaborating in detail on the context of the study through mapping actors in Jiroft regeneration programme. The chapter outlines the relation of mapping and planning in Iran from an historical perspective to the present. Subsequently I analyse the ways in which maps are made and produced in regeneration programmes. My findings in chapter four I elaborate on mapping practices and maps as a product of planning in Jiroft project. Accordingly, chapter five describes the consultancy's urban planning studio as a space of making knowledge. Thereafter, the chapter presents the discussions and analysis of the FGD. It is important to note, that I use the actual names of the participants as their respective identities in this context are not considered confidential. Simultaneously, the chapter presents analysis of a series of map in Jiroft regeneration project to identify what do maps show and don't. Finally, in chapter six I draw conclusions by once again emphasising on the outcomes of the research. I argue that how mapping reflects and produces assemblages of urban poverty in regeneration projects in Iran as we see in this research.

Chapter 2 STS and the City debate

This study draws on recent scholarship on the intersection of two highly interdisciplinary fields of science and technology studies (STS) and urban studies to describe an emerging epistemological and/or ontological framework that interprets cities as sociotechnical ensembles. In this vein, I will initially review the most influential strands of literature within STS and the city writing to identify the traveling of concepts, topics and theories from both STS and urban studies. Subsequently, I will elaborate on the influence of Actor Network Theory (ANT) in urban studies (Farías & Bender 2009) and how laboratory studies have emerged in new experimental spaces to invest in different applications of making the world, or rather the urban environment– the city (Farías & Wilkie 2016).

Going beyond classic ANT studies, I try to encourage an increasing interest in the application of assemblage thinking. Later I will discuss the intersection of what is known as "assemblage urbanism" and post-ANT approach. This chapter concludes that assemblage thinking can be effectively adopted as a way of thinking about cities. Urban assemblage thinking provides a theoretical lens for understanding the hybrid and complex nature of the city with an emphasis on the relations between sociality and spatiality as a process of making realities.

2.1 Conceptualising the urban as the object of planning in STS

The object of urban study is as varied and fast changing as cities' environment in our contemporary urbanised world. Influential postcolonial urban studies writer, Soja (2000), wrote on the ever-expanding subject of urban studies: "…the field of urban studies has never been so robust, so expansive in the number of subject areas and scholarly disciplines involved with the study of cities, so permeated by new ideas and approaches, so attuned to the major political and economic events of our times, and so theoretically and methodologically unsettled. It may be the best of times and the worst of times to be studying cities, for while there is so much that is new and challenging to respond to, there is much less agreement than ever before as to how best to make sense, practically and theoretically, of the new urban worlds being created." (Soja 2000, xii as cited in Brenner and Schmid 2015). The very foundational debate on 'the urban question' since

early twentieth century (Walker 2015) traces back to the 1920's era of the Chicago School of sociology. Urban studies at the time, approached cities as spatial forms and ecological niches (Farías 2009). Such an approach argues that human communities settle down to compete for prime location and access to resources that foster innovation, growth, as well as invasion and succession processes over the rival powers. The main outcome of looking at such dynamics has been a focus on relationships of modes of settlements and societal movements and spatial formations (Farías and Block 2016, p.555).

Another crucial strand of theorising cities goes back to Max Weber's comprehensive analysis of cities as capitalist politico-economic actors. Henry Lefebvre expanded this Marxist view to reimagine cities as key sites of political struggles (p.556). In the 60's and 70's, George Simmel, Jane Jacobs and Michel de Certeau opened new discourses involving specific cultures of urban life and practice as well as psychological life of urban dwellers (p.556). Hence, more recently scholars such as Brenner (2009; 2011) and Goonawardena (2011) have called for rethinking of the urban and the very object of urban studies towards what they call a more fruitful and critical understanding. Brenner has a lead in this school of scholarship which seeks to address the practice of building urban environments and not just the study of (dis)articulation between capitalism and urbanism.

Brenner and Schmid (2015) state that on a conceptual level, urban territory is concerned with the ontological politics of the object of planning and the ways in which capitalist economies expand the city to new agglomerations that goes beyond any fixed boundary. The ways in which cities are built, inhabited, controlled and changed is yet the matter of searching for what is the urban and where it ends (p.152). In this line of thought, cities are inherently the sites of competing political ontologies in the race for accumulation of capital and control over resources and population (p.153). These ontologies are analysed within the political projects of urban territory and planning practices. The triangle of territory-planning-politics is yet an object of many studies to define each of them in relation to the other. This approach known as critical urban studies define urbanisation and its forces as a process of becoming with no a *priori* but a strong emphasis on power relations between the state, the market and the people in the making of the urban (p. 154).

2.1.1 Tracing science and technology in the city

Considering the role of new technologies in the way in which the urban settings are shaped worldwide, Farías and block (Farías and Blok 2017 p.555) feel that bringing STS into the city remains urgent. In this light, several contributions have emerged in the field of STS and urban studies in the past two decades or so. The main effort to collectively

theorise urban studies through STS was Farías and Bender (2009) and McFarlane's (2010a; 2010b) enquiry, with the perspective of "assemblages thinking" and "assemblage urbanism" (Blok 2013), and more recently "urban cosmopolitics" (Farías & Blok 2016). Other attempts in theorising the urban through the lens of STS, built upon a novel concept such as "endostructure" by Guggenheim (2009) while others refer to Social Construction of Technology (SCOT) (e.g. Hommels 2005) and actor-network theory (ANT) (e.g. Farías & Bender 2009; Kärrholm 2016) as well stablished STS concepts. Scholars of critical urban studies such as Brenner (2011) and Klauser & Söderström (2015) have emphasised the limitations of STS in encountering the city as a whole and not as an object, which became a crucial debate in new theorising of the urban. However, the variegated ways in which the city is being conceptualised and theorised remains a common interest in STS and urban studies with a rapid development and evolution in notions and approaches.

I refer to Farías and Blok (2017) framing of three major avenues of scholarships in STS and the city, to give an overview of how STS has travelled into the city debate to introduce a new epistemology of the urban in strong relation to the working of science and technology in city. The first approach, considers the working of science and technology in the city as whole and analyses the technoscientific objects and practices by those who made it and the effects they have on the social. Studies in this tradition are in line with the social construction of technology (SCOT) and focuses on technological frames of artefacts in the city made by planners, engineers and architects. These artefacts include various urban infrastructures from controversies associated with building a bridge (Woolgar and Cooper 1999; Winner 1980) to large urban infrastructures (Hughes 1983; Coutard 1999; Graham and Marvin 2001).

One influential study in this tradition that focuses on planning practices is Aibar and Bijker's (1997) study of the Barcelona Extension Plan, as part of the Olympic Village. The study views the city as an enormous artefact to be interpreted as remarkable physical records of the socioecological world in which the city was developed and conceived. They proposed a new concept of power to first, avoid the normative view of technology as a medium or instrument of exercising power; second, to complement the concepts of social shaping of technology in a form of politics of technology (p.23). Hommels (2005), influential work turned into looking at effects of urban planning and newly built environment in cities. Much of her vocabulary, points to different political patterns of (un)building processes in cities. The core theme of her work discovers "three constructivist conceptions of obduracy," or the capacity of the built environment to resist change. She exam-

ines empirically the notion of *obduracy* in three large scale urban development plans in the Netherlands which shows how cities are not entirely changeable. The plans were comprised of a huge shopping mall in addition to network infrastructure, residential and cultural spaces. The plans were all under negotiations and changed accordingly throughout time. Her analysis views the city as 'technological artefacts' (p. 15). This view builds upon SCOT to present complexities of each conceptual framework and the ways in which they frame the sociotechnical development projects in the city. This is the conflicting nature of introducing and planning for a new development on an existing urban space. The technological and material relation of social actors are based on a specific plan and is therefore designed in this regard.

It is interesting to observe that all the studies following SCOT tradition empirically focus on cities that are highly planned in newly built environments. Hommels for instance analyses Dutch urban infrastructures with strong modernisation agenda; Aibar and Bijker's study also focuses on Barcelona which is famous for its enormous grid logic planning structure. Thus, the notions of technological artefacts and politics of technology in the making of urban environment is mostly articulated in a space of highly planned practices in which engineers and planners form a coalition with politicians to construct the social and the environment. Yet, these studies remain influential but only for similar environments. None of the SCOT studies have been concerned with unplanned areas such as informal settlements.

The second avenue, mentioned by Farías and Blok (2017), is dedicated to the built environment focusing on conceptual challenges associated with understanding what buildings do and how architects work on their realizations (p.557). Guggenheim's (2009) most celebrated work, demonstrates buildings as "mutable immobiles" rather than technologies. In this work, he made the call to do 'reverse STS' for architecture critique by studying buildings in use instead of technologies in design. Accordingly, Guggenheim & Söderström (2009) proposed a differentiated cosmopolitics in order not to prematurely close the city or categorise the urban as this would inhibit a full understanding of how cities come into being. Andres Blok (2013), refers to Aibar and Bijker's study and goes beyond the politics of technology. He views ANT in an urban context as a new ontology in the field which puts urban political economies, 'eco-socio-technical' design and transformation processes in examining heterogeneous and dynamic assemblages of humans and non-humans (p. 18). His study unfolds the process of translation of notions on a large scale sustainable city building project in Europe through the lens of ANT.

In the working of design as a practice of planning and architecture, Farías and Wilkie (2015) propose an analytical study that focuses on architecture and in general creative industries studios as a site of research. They call it "studio studies" which is the in line with "laboratory studies" but in different space of knowledge production in the making. I shall get back to this later in the coming chapter where I explain the urban studio as a space of knowledge making for the city.

The third and final strand, focuses specifically on assemblage urbanism and concepts and perspectives of Actor-Network Theory as a novel theoretical framework to study various issues regarding the city. In this line, Bender (2006) defines ANT as a new epistemology in studying the urban and revisits both ANT and urban studies from a new perspective. In describing ANT in urban studies, he states that: "…ANT goes well beyond identifying chains of relations; ANT redefines and aggregates, but aggregates with open borders and is capable of continual transformation. […] This capacity of ANT to reveal the interconnections of active and continually transforming networks seems to suggest it as a way of exploring urban life. […] deploying ANT in urban analysis seems to be a natural extension of it, and a significant move forward in urban studies" (Bender, 2006; as cited in Farías & Bender, 2009, p.304).

Subsequently, Farías & Bender's (2009) edited volume book gathers many examples and challenges that ANT provides, in combination with urban critical theory, a new ontological approach in analysing cities. The authors draw different perspectives in the literature of STS and the city. They emphasise the fundamental differences in ontological and epistemological understanding of the city that ANT offers. The object of the book is based on the gap in urban studies which dates back the 70's with the work of Marxist political economy in urban studies. The book offers a new approach that catches up with new developments in social sciences and STS scholars. The edited volume, as a collective of new studies, explores how ANT can/have influenced urban studies and what new perspectives it provides. They call this new approach "urban assemblage". Furthermore, ANT for them provides rather "a useful and plastic toolbox for urban studies, a broad pool of perspectives for questioning cities in new ways. What all these perspectives have to offer is a rich theoretical ground to develop radically relational and symmetrical understandings of the city (p. 8)."

This summary of how ANT has changed the study of the urban is inherently poststructuralist with a strong political agenda of what is the urban and how it is (un)made. In the end, they conclude that: "ANT entails an imbroglio of theories, authors, questions and

sensibilities, which cannot be strictly used as a theory of anything." (original emphasis, p. 8).

2.1.2 Urban assemblages: a material-semiotic approach

Urban assemblages has received a great deal of attention from different academic scholars and in a variety of disciplines. This is particularly true for disciplines related to sociality and spatiality including geography and urban studies. Assemblages of urban sociality and materiality is a view that is rooted in Deleuze and Guattari's (1987) philosophy that offers new ways of constructing the social and the material relations in any given context. Any attempt to ground one's analysis in material-semiotic relation demands an understanding of assemblage thinking and the reading of Deleuze and Guattari, which is accompanied with different interpretations and conceptual frameworks.

As a theory, the urban assemblage addresses the city as a "multiplicity" rather than as a "whole" (Farías 2011). McFarlane (2011a) explains multiplicity as something that is produced in a continues process of construction. He (2011b) further frames assemblages as a "verb" in the city that is always in the making of the urban or in his terminology "making urbanism". Such a process is, then, the result of the web and relations between different elements in the assemblage. For McFarlane (2011a; 2011b) "assemblage urbanism" is inherently a political approach in which the actual and the possible relations in the city are the core focus of the analysis. He refers to "co-functioning" of the elements and the actors as an exchange between stabilising and destabilising situation. Rejecting the existence of a single "assemblage urbanism" in urban theory, McFarlane adopts political economy theories to think through various relations in the city. However, in urban studies, assemblage thinking has been challenged by some school of thought such as political economy and critical urbanism.

Brenner (2011) famously raised the question of whether urban assemblages adds anything to the critical urban theory in the *City* magazine volume 13. He first explains how critical urbanism interrogates the urban formations by scrutinising the foundation of major urban issues including: poverty, inequality, injustices and power. He mentions that "urban assemblages" does not implicitly provide much to address the 'urban question', plus such a relational thinking is not new. Rather than addressing assemblage thinking as a basis for the critical urban theory, Brenner, Madden, and Wachsmuth (2011) tend to adopt assemblage theory in relation to the political economy with new methodological advancement. The Authors criticise that assemblage urbanism with the

tick descriptive focus ignores the "context of contect" regarding the broader power-laden hegemonies (p.324).

In respond to such criticism, Farías (2011) argues that since assemblage thinking involves both agency and arrangement, assemblage thinking tends to develop empirical knowledge rather than theoretical analysis or critique. He states that in the classic Marxist urban theory a general theory of the relatively fixed concepts was on the core enquiry of the urban, whereas, assemblages thinking is a explorative engagement in the ways in which the urban is in the constant making. He further denotes that the critique is better suited for empirical practices rather than general theories (p.369) that are rooted in the post-structuralist and ethnomethodology school of thought agenda in social sciences in which STS has a strong presence.

Nevertheless, exploring the space of possibilities can become a particular line of enquiry in both theory and practice where the question would be how to question the urban and what stage of becoming is in stake. Therefore, following the logic of assemblage in urban context demands a shift from the analysis of fixed parts to the analysis of the relations across different scales and actor-networks. In this vein, the process is the focus of the study and not the product.

2.2 Thinking assemblage

The idea of assemblage has been addressed as "*agencement*." This refers to the process of putting together a mix of relations. Thus, urban assemblage refers to the "process" of arranging and organizing claims for identity, character, and territory in the city (Kamalipour and Peimanian 2015). The Authors refer to DeLanda's reading of Deleuze and Guattari's conception of assemblage, to theorise the social through exploring the multiplicity of thinking assemblages (p.402). They refer to DeLanda, Anderson and McFarlane to frame assemblages thinking in the city context as "heterogeneous human/non-human, organic/inorganic, and technical/natural elements (p.405)."

Similarly, others see assemblage thinking as a focus on both actual/material and possible/emergent (Farías 2010). Deleuze and Guattari (1987) emphasize that assemblages are fundamentally territorial where territorialisation is both spatial and non-spatial, in another word, the social (DeLanda 2006). The territory is a stabilised assemblage (Dovey 2010). For DeLanda (2006), the conception of assemblage varies along two axes; on the horizontal axis "deterritorisation or destabilisation" stands on one end and "territorisation or stabilisation" on the other extreme. On the vertical axis "sociality or express" sits

at the top and "spatiality or materiality" at the bottom. Any analysis of what is an assemblage is situated in between these four stands. Hence, assemblage theory is against an a priori reduction of sociality/spatiality to any fixed forms/set of forms in terms of processes or relations, which is a way to avoid a naïve interpretation of the social and the material (McFarlane, 2011b).

In short, assemblage thinking is about relations, heterogeneity, and differences rather than parts, homogeneity, and similarities. Assemblages are constantly in fluid status of "becoming" and "emerging" rather than "being" (Farías 2011), which requires a "multiscale" explanation (DeLanda 2006). Meaning, "becoming" is the process of unfolding the complexity of events in between territorialisation and deterritorialisation of an assemblage (Kamalipour and Peimanian 2015).

2.2.1 The general logic of assemblage

Nail (2017) provides a comprehensive understanding of what is an assemblage. His enquiry to draw a "fully fledged" assemblage theory comes from readings of DeLanda and Deleuze and Guattari. In this account, the "general logic of assemblages" is based on three major theoretical formations. First, all assemblages are composed of a basic structure including: a condition (*abstract machine*), elements (*concrete assemblage*), and agents (*personae*) (p.37). The "*abstract machine*" is a notion proposed by Deleuze and Guattari to define that all the assemblages have conditions that are the network of specific external relations that holds the elements of an assemblage together (p.24). The "*concrete assemblage*", then, is a set of specific elements that are arranged in the conditional relations (an abstract machine) of an assemblage (p.26). The "*personae*", is another feature that is shared in all the assemblages, which is a term by Deleuze and Guattari for agency. The following quote from Nail explains the relation of the assemblage structure: "[…] the *personae* of an assemblage are the mobile operators that connect the concrete elements together according to their abstract relations. […] they are not the origin of the assemblage and do not control or program the assemblage in advance. Rather, *personae* are the immanent agents or mobile positions, roles, or figures of the assemblage." (p.27).

Second, Nail (2017) refers to the ways or types of arrangement in which the structure (the conditions, elements, and agencies) of different assemblages are laid out. He categorises them into four basic assemblages: *territorial*, *statist*, *capitalist*, and *nomadic* that are (p.28). The content of assemblages is heterogeneous and have a topology that Deleuze and Guattari call the *politics of assemblages*. In this sense, all the assemblages are inherently political (p.37). Yet, each assemblage is always a mixture of four types

(*territorial, state, capitalist and nomadic)* to varying degrees (p.37). The general characteristic of the topology of assemblages is about the various ways that the structure gets to dominate and drive the other parts.

The first type, the *territorial assemblage,* refers to a set of "natural" limitations that selects and then cuts and finally redistributes concrete elements in relation to the condition and the agency. *Territorial assemblages*, therefore, are structures that have arbitrarily delimited its parts but within a set of specific limits. For example, Deleuze and Guattari point out that "the house is segmented according to its rooms' assigned purposes; streets, according to the order of the city; the factory, according to the nature of the work and operations performed in it" (*A Thousand Plateaus* 208, as cited in Nial 2017, p.29). In the territorial assemblage, the concrete elements become privileged and primary. Change happens progressively, one concrete point at a time (p.30). The second type is *state assemblages*, that are basically the control practices that a state imposes to shape and form the condition. Deleuze and Guattari call this process "*state overcoding*" that creates hierarchies in different manners including: statist science (statistics), statist art, statist linguistics (Chomsky), and so on. The third type is the *capitalist assemblage*, which is inherently about the role of agency or personae that quantifies the qualities in the other two assemblage types in order to translate elements and conditions into acceleration of "productions for the market". Deleuze and Guattari call this process "axiomatization" which forces unqualified elements into homologous quantitative relations.

However, the last assemblage type is the *nomadic assemblages*, that metaphorically builds on the lifestyle of nomadic people, whose movement is not directed toward a final end (a static territory or state) but functioned as a kind of "trajectory" (p.32). Nomadic assemblages revolutionise the ways in which the structure is ordered and emancipates the structure from arbitrary limits or hierarchical uses and meanings. Nomadic assemblages change the condition, the elements, the agencies into new combinations. This rather revolutionary type is about how to think about the relations and limitations from another perspective and create a new setting. In contrast to other types of assemblages, the nomadic assemblage constructs a participatory arrangement in which all the elements of the assemblage enter into an open feedback loop in which the condition, elements, and agents all participate equally in the process of transformation (p.33).

Finally, all assemblages are constantly changing according to four different kinds of change or "*deterritorialisation*." Deterritorialisation is the way in which assemblages continually transform and/or reproduce themselves (p.34). Nail notes that referring to Deleuze: if we want to know how an assemblage works, we must ask, "What types of

change are at work?" Deleuze and Guattari (1987) in different notes emphasize that assemblages have no essence. There are only events, which consist of concrete elements and conditional relations. One does not transcend the other, but all are transformative (Nail 2017, p.26). Therefore, as elements change in the condition, so do the relations and their networks. One can understand what an assemblage is by asking what can it do step by step; and what are the elements in each point that form a set of exterior relations. The task would be to determine what type of assemblage it fits into and lastly how it changes and why. I shall return to the type of assemblage as a way to describe the sociospatial character of urban poverty and how assemblage thinking helps to frame such places.

2.2.2 Nomadic assemblages in an urban context

Critical urban studies have mainly looked at the city and marginality from the analysis of the social, cultural, spatial and economic backdrop. Such analysis shows the inequality of urban development against the construction of urban poverty. Urban assemblages, however, as we have previously seen, engage more-than-human agencies (Farías and Bender 2012), unpredictability of actors' role in construction of urban atmospheres (Anderson, Kearnes, McFarlane and Swanton 2012) and take a positivist approach into critical urbanism (McFarlane 2011). Urban assemblages' literature still falls short in taking urban poverty fully into consideration and providing a framework for analysis. Hence, I undertake the nomadic assemblage in Nail's (2017) framing of the typology of assemblages to configure urban poverty as a space of socio-material configuration.

The most important characteristic of the nomadic assemblage is that conditions, elements and agencies of the assemblage are able to change and enter into new constellations without (or with less) limits (Nail 2017, p.32). Nomadic assemblage, thus, stands in contrast with the capitalist assemblage as well as the state assemblage in which conditions, elements and agents participate equally in the process of transformation (p.33). Urban poverty as a space of socio-material assemblage, then, is constantly a competing or even conflicting environment between the city (state/capitalist assemblage) and the unplanned/informal constellation– the nomadic assemblage. Therefore, urban poverty as a nomadic assemblage provides an analytical framework in which elements, conditions and agents, on the one hand, participate equally and freely in the constellation of space; and on the other hand, it is in a constant process of transformation/becoming a new space in confrontation with the state and the city management.

Such a framework would help to realise how urban poverty comes into being; how it is performed; and constructed/de-constructed in the relational entanglements between the

city and the people in such places. The point is to investigate urban poverty not as a static condition that can be labelled *a-priori*– the unplanned/the informal - but to render it in its on-going nuanced development open to the more-than-human (Farías and Bender 2010) and the unpredictable (Anderson, Kearnes, McFarlane and Swanton 2012).

2.3 Reassembling the city: mapping actor-networks

Cities are truly spaces of thrown-togetherness, the multiplicity of heterogeneous elements (material, semiotics and actors) come together to shape the urban environment, space and time. Cities are the dominant space of making the world and unmaking it at the same time. So far, I have conferred that assemblage thinking invites scholars to overcome the premised dualist thinking of global-local, structure-agency, and social-material to envisage cities as imbroglios of different elements, networks and flows in specific space and time. Assemblage thinking is essentially about indeterminacy, emergence and multiplicity. In this vein, several authors (Nail 2017; DeLanda 2006; McFarlen 2010; 2011) have raised objection on the English translation of the French word "*agencement*" to "*assemblage"*. The term in a nutshell suggests the way in which human and non-human components are linked in a rhizomatic, multiple and in the process of becoming network.

Additionally, I identified assemblage components and ways of analysis and some of the notions and concepts associated with it. Assemblage components include actors (elements or concrete assemblages), discursive elements (semiotics, conditions or abstract machine; in the urban context it may refer, is but not limited to: statements, plans and policies) and materials (nature, buildings, infrastructure, etc.). The analysis of components in a city assemblage, as Allen and Cochrane (2007) state: "…one should take into consideration that components are made up of 'fixed and mobile expertise and regulations' regardless of their distance to one another, which are always in the process of territorialisation (coming together) and deterritorialisation (pulling apart)" (p.1166).

Here, analysis of the relation of actors–materials–semiotics is the core theoretical framework in assemblage thinking. Then, one should arrive to the specificities of the study to empirically investigate the process of becoming. Urban planning consists of a specific set of assemblages that reflects and produces realities of the place in a specific context. I will come back to the specificity of the study in later chapters. Yet, I should make a step back and ask who are the most important actors in the urban planning actor-networks. How do the actors come to form a network and by what means? In addressing these questions before getting to the context of the study, here, I refer to the core object

of STS scholarship that John Law (2016), one of the key figures of ANT, states as a practical method to find out how science and technology shape the world. And how does the world in turn shape them? The empirical question here is, then, how all this works in practice? ANT scholars often refer to it as 'technoscience', as a set of social and material practices that work in different ways in different locations (p. 31).

Series of observations have been conducted in different fields to theorise and conceptualise the expertise practices and the ways in which they produce knowledge that reassembles the world. The early attempts opened space for a diverse range of laboratory studies (e. g. Knorr Cetina 1981; Latour and Woolgar 1986) which through various ethnographic methods explored the construction of knowledge and how it is shaped by social interest. Michel Callon (1986) in his celebrated article about the decline of the scallop population in Saint Brieuc Bay in France shows how scientists, fishermen and scallops in a research project failed to combat the issue. The success of the article, though, was due to how Callon treats the three main actors in a same vein and at the same level. His work is known as sociology of translation that identifies four moments that forms a functioning actor-network. The first moment in his analysis is: 'problematisation', in which actors negotiate the nature of the problem and agree to form a coalition to solve it; Callon calls this process an "*obligatory passage point*", where all the actors relate to it in order to communicate and connect to one another. Obligatory passage point (OPP), is one of the core nodes in analysing and recognising actor-networks and the ways in which actors (human and non-human) come to form a network.

Other influential ANT works have introduced crucial notions and concepts in analysis of actor-networks. John Law (2016) provides a summary of ANT concepts and frames them all as methods for assembling, stabilising or undoing realities. He mentions that: "… these methods include delegation into durable materials (Latour: 1987), the creation of circulating immutable mobiles (Law 1986) or fluid and mutable objects (de Laet and Mol 2000; Yates-Doerr 2014), inscription devices (Latour 1998), and the preformatting of distant locations (Latour 1988). They also include the logic of tactics (Callon 1986), and multiple modes of ordering which work together to secure temporarily robust human and non- human arrangements (Latour 2013; Law 1994; Law 2002; Thévenot 2001) (p.42)." All these ANT driven projects have produced notions that explain reassembling process of actor-networks through elements and events that come together to shape a functioning or a failing assemblage of technoscience in society. However, each of the notions can only be partially applied in different cases and therefore it is context (time and space) dependent.

At the empirical level, this study focuses on urban planners as experts and engineers of the city who have a hand in the shaping of the urban environment and the knowledge that is associated with the city. In a recent collective attempt Farías and Wilkie (2016), propose a new programme of studies in the form of "studio studies" that define studios as a creative force for design practices and cultural industries as key in the revitalisation of current capitalist societies. Their proposal builds on laboratory studies (e. g. Knorr Cetina 1995) and ANT scholarship, but it is not limited to it. Studio studies, therefore, borrows ANT notions and concepts that scholars used to describe the process of knowledge making in laboratories to a different setting/space of knowledge creation. Authors, specifically aim to investigate studios as spaces of knowledge creation and management.

Studios in this sense, refer to offices and design companies that are carrying the innovation agenda as a new paradigm in market economy capitalist societies. This shift has invited researchers to study "how the production, manipulation and circulation of material inscriptions through different media, technologies and bodies makes possible cognitive processes that no single person can perform (p.5)." This new ethnomethodologically oriented study builds on laboratory studies and further emphasises what Latour (1987) states as undecidedness in what actor to follow and being sensitive about non-human agency in the network creation. In urban planning life circle mapping and maps are a central node in forming the life and practice of urban planners.

2.3.1 The urban planning studio as space of knowledge making

Architectural and urban planning offices, *per se,* are spaces that different human and non-human actors consolidate to influence the process of how the city is built, imagined or planned to be. Observations of urban planning studios as spaces of knowledge making, as mentioned before, arrive from Farías and Wikie's (2016) proposal for studio studies. As mentioned before, studios refer to offices and/or spaces in creative and design companies. The urban planning studio, as such, rather refers to an office style space in which planners work in collaboration with various experts to think innovatively about cities. The authors draw inspiration from the laboratory studies approach for understanding the production and contents of scientific knowledge and objectivity and apply it to studios as spaces of creation of cultural artefacts (p.8). In this programme of scholarship, authors suggest a set of questions to be addressed. Here, I translate it into urban questions; How do cities and the different urban environments within them, come into being? How do urban planning practices operate (perform, produce, reflect) as a situated practice? Notwithstanding a growing interest in new approaches in studying the urban, there is yet

a lot to contribute in the ways in which urban planning and architecture are practiced, especially from sociological and anthropological points of view (Farías and Wilkie 2016).

The authors introduce the notion of 'distributed cognition' as a field of study to understand how the production, manipulation and circulation of material inscriptions through different media, technologies and bodies make possible cognitive processes that no single person can perform (p.4). Much like the ANT methodological dictum they propose research that follows the actors in the process with sensitivity to non-human processes and entities (p.5). Accordingly, in series of studies that observe various studios such as game, video, advertisement, design and architecture studios, they invite researchers not to only emphasise the stable configuration of strong assemblages, stable configurations and powerful alignments of people and things (p.11), but, to pay attention to relational attachment to different elements that take hold, unfold and shape the real (p.12).

This study follows a same dictum to investigate mapping as a fundamental praxis in urban planning. In this line, I ask how it reassembles the city and particularly the urban poor areas, that are known as informal settlements; or places that planners had least agency in shaping. Maps and mapping are critical passage points that shape the knowledge of "place" as well as creating the reality that it is meant to represent the socio-ospatial situation of a city. In this line of thought, in the third chapter I specifically look at the map as a subject of study from STS and the "critical thinking" point of view.

2.3.2 Mapmaking, mapmakers and the map

I have pointed out several times that scientists, engineers, experts and policy makers are among the main groups that STS scholars focus on as key players in (re)assembling the world. This group of actors in a series of practices creates networks of relations with other actors and actants that is connected to other networks. Such thinking is radically relational and temporal. In an urban context, urban planners are with no doubt in the centre of how cities are imagined and planned to be built. Urban planning as a practice also includes different expertise and political actors that mobilise resources and put the planners in charge of what later becomes the space for knowledge making– urban studios or perhaps urban laboratories.

The map, in the Deleuzian concept of assemblage thinking (Kamalipour & Peimanian 2015) can be understood as an "abstract machine". In this vein, mapping is a practice which abstractly illustrates the complexities of an urban assemblage as both a product and a process. Yet, the map fixes time and concepts in a complex representational process of translating realities into signs, visuals and meanings. In a similar manner, map-

ping can be considered as an abstraction that has the capacity to unravel what DeLanda calls the "real virtuality", which is a kind of "reality" that has not been "actualised" yet (DeLanda 2006, as cited in Kamalipour and Peimanian 2015, p.408). As such, Latour (1990) shows in "Drawing things together" that diagrams, maps, and types have the capacity to produce a kind of "spatial knowledge" that can be effectively used as a basis to draw on the ways in which the city works in relation to spatiality and sociality. Spatial knowledge also assists with specifying the space of possible solutions for the existing city problems and embodied capacities for transformational change.

Mapping is framed as a network building node which relates and is related to many different actors and other networks. In a sense, assemblage thinking also sees maps as nodes that territorise and deterritorise socio-material agency in the situation that it targets. Maps, as the production of mapping, amalgamate human and non-human actors, to translate the context into a matter of concern that is therefore subjected to knowledge making and acting. That is what ANT scholars, as mentioned above, call "obligatory passage point" (Callon 1986; Law 2009). Maps with regard to planning are devices of sense making (technology) that relate as well as translate the components of elements and actors on the map.

In the next chapter I will elaborate in detail the concerns and questions related to maps and mapping in the context of urban planning from the stand point of material-semiotic and assemblage thinking. Moreover, I will look at the map agency and the ways in which maps and mapping historically played a role for the powerful and colonisers or imperialist powers. Yet, I will try to present some alternative ways to emancipate maps from their historical power practice discourses. A series of different ways of looking at the map and mapping technics is viewed in the next chapter. Finally, all the discussions will be narrowed to the point that the context of the study is concerned about and some of the facts that make the situatedness of the study in its context and in relation to the actors involved.

Chapter 3 Mappings

" .... Thus are the villain cowards fled for fear,
Like summer's vapours vanished by the sun;
And, could I but a while pursue the field,
That Callapine should be my slave again.
But I perceive my martial strength is spent:
In vain I strive and rail against those powers
That mean t' invest me in a higher throne,
As much too high for this disdainful earth.
Give me a map; then let me see how much
Is left for me to conquer all the world,
That these, my boys, may finish all my wants.
[One brings a map.]"

Christopher Marlowe 1587, Tamburlaine the Great, Part II.
ACT V. Scene iii. 123-39.

Mapping, its theory, praxis and technologies, is a rapidly changing and exciting field of study. Intellect, capital, culture and innovation are reshaping how maps are made, used and thought about (*Kitchin, Perkins & Dodge, 2009)*. Drawing on the recent strands of literature on map studies and critical geography, here I review mapping practices and mapmaking in relation to knowledge and decision-making as an agency in urban planning and beyond. In this chapter, I will consider mapmaking and the discourses associated with territorial and social representation of the map, knowledge making and visualisation of the map and finally inherent power relations and power practices in mapping. Then, I will try to examine different ways in which maps and mapping are theorised and analysed in an emerging field of map studies. Finally, from poststructuralist approach, in particular the ideas of assemblages by Deleuze and Guattari (1987) and Bruno Latour's (1987) experiments in socio-spatial relations through ANT lens, I will discuss that: maps are not mere representation of the world but in a constant state of becoming.

3.1 The object of mapping

Mapping is both an epistemological and ontological matter (Kitchin, Perkins & Dodge 2009). It is both a way of thinking about the world, offering a framework for knowledge, and a set of assertions about the world itself (p.393). Therefore, any thinking about mapping involves a distinction between the knowledge claims that the map is trying to represent and the practice and artefact that produces it (p.390). Maps shape our assumptions about how we can know and measure the world, how maps work, their techniques, aesthetics, ethics, ideology, what they tell us about the world, the work they do in the world, and our capacity as humans to engage in mapping (p.11). Mapping as a process involves different networks of actors and actants that come to shape realities that the map is not just representing, but making based on the cultural context the map is formed in and or the purpose that the map is made for (Corner 1999; Perkins 2009a). In this light, mapping is a socially constructed reality maker that is in a constant process of becoming in relation to mapmakers and map readers (Harley 1989; 1992; Pickles 2004; Corner 1999).

3.1.1 Purpose, power and knowledge in mapping

James C. Scott (1998), in a study of failures of state in imagining and implementing national agendas, describes how cities, people and language have taken shape from medieval cities in Europe and in the Middle East in the modernisation times. He shows that how organically grown complex pattern of cities was subjected to planning and reorganisation in Europe after the emerge of state powers. The new patterns were mainly based on the logic of grid to serve state's objectives for control and easy accessibility. This is the first imaging of cities as planned territories in oppose to the unplanned (p. 53). Subsequently, author shows that how historically major cities in France were subject of careful military mapping, when urban revolt occurred after the French revolution. Authorities wanted to be able to move quickly to the precise locations, therefore, states and city planners had to overcome the unplanned cities to a logical square shape form for easy accessibility to administer and to police (p. 55). He states that, this new form later seeded new socio-economical structures for homogeneous, geometrical, unified property structure for "the market" (p. 57).

Maps as any other form of documents and scientific artefacts (discourses in general) embody power in variety of ways (Turnbull 1989, p.54). Foucault (1977; 1991) classic concept of governmentality in the technology of surveillance and control shows the entanglement of power and knowledge, which has gained a wide influence on geographers and study of maps (Space, knowledge and Power, 2007) also applies into maps. Maps are a

form of knowledge, therefore, have power in the ways in which they manipulate and control the reality of place. As such power drives all interpretation and presupposes a configuration in field of practices and social roles. Power, thus, has purposes to sustain the intelligibility of possible interpretations within the field it targets. Maps reshape and constrain agents and their possible actions (Turnbull 1989; 2000).

Brian Harley (1989) notes, in a same vein by refers on Foucault's critique of science, power and knowledge that maps are imbued with values and judgements of who makes it (as cited in Kitchin, Perkins & Dodge 2009, p.9). Others, in this tradition, such as: David Harvey (1989), Denis Wood (1992) and John Pickles (2004) go further and reveal the inherent involvement of ideology in mapping and identify "…. Colonialism, property ownership, national identity, race, military power, bureaucracy and gender as key roles in mapping relations (Kitchin, Perkins & Dodge 2009, p.10).

David Harvey (2011), in a similar object of study, shows that how Cartesian rationality served capital accumulation during the enlightenment projects in the West, which made the current capitalist societies that is entangled with property registration, survey and standardised measurement for exchange of goods and products, all in which are projected on the map and in the hands of the powerholders. Scott (1998), further, shows that how objectively state's produced maps have served the purpose of the ruler. Legibility implies a viewer whose place is central and whose vision is synoptic (p. 78). Author calls this process 'state simplification' as an ongoing project of legibility from different sources of data and with different methods (p. 80-81). In another word, state simplifications of the kind are designed to provide authorities with a schematic view of their society, a view not afforded to those without authority (p. 79).

State simplifications have the character of maps (p. 87). Maps summarise precisely some aspects and ignores the rest. A map is, thus, an instrument designed for a purpose. It either serves or fails to serve the purpose (*Kitchin, Perkins & Dodge, 2009)*. Albeit, the recent open source online technologies such as Google Map Maker have made efforts to overcome this boundary, yet, mapping creates the power to transform –not on the map but by those who deploy the perspective of that particular map.

Benedict Anderson (1983; 2006), in an attempt to analyse how state nationalism ideology were stablished, shows three major institutions in charge of nation building projects as a colonial project: the *census* (the nature of the human beings it ruled), the *map* (the geography of its domain), and the *museum* (the legitimacy of its ancestry). These institutes profoundly shaped the way in which the colonial state imagined its dominion through mass media, the education system, administration regulations and so forth (p.

163-164). The map in Anderson's account, came to play by colonial powers to settle a fixed imagination of territories that categorises the social structures based on differences– whether it be ideological belief or human race. This process led to flow of "othering" and discrimination (e.g. Said 1994[4]; Crange 1998).

All the mentioned classical studies show the correlation of power and purposes it pursues in making a knowledge of the place. Mapping from this perspective is fundamentally power practice. However, the object of the map relates to the ways in which we also theorise the map and make them which in turn they shape the sociospatial reality. The theory of the map therefore seeks to disclose how the map is made; who makes it; and what kind of effects it makes and creates.

3.2 Theorising the map

The genealogy of maps as a subject of study reveals how mapping historically served the colonisers and the rulers as a spatial knowledge for power and control practices that shaped the world today (Foucault 1979; Scott 1998; Mitchel 2002; Anderson 1991; Wood 1992; Hull 2012; Turnbull 1989). Nonetheless, beyond the discourses on mapping and power practices; map studies have also been subjected to philosophical and epistemological studies (Harley 1989; Pickles 2004; Corner 1999; Latour 1990; Kitchin, Perkins & Dodge, 2009; 2011). Data, statistics, visualisation, representation, territory, knowledge, propaganda, enforcement, order, discipline, navigation, perception and so many other functions of the map has been scrutinised in the body of literature in order to theorise what is the map and how it gets shaped and shapes the territory it represents.

Kitchin, Perkins & Dodge (2009; 2011), in a collective effort gather a series of academic and artistic works that attempts to theorise maps and mapping as a field of study. Authors in an edited volume titled "Rethinking Maps" provide a comprehensive reading of maps and the ways in which mapping and maps are theorised and practiced. They propose three propositions to study maps and mapping (2011, p.117): First, the "*modes of mapping*" which deals with the very question of what to study in this field and what is the question. Following Mattew Edney (1939) authors define the object of map study as an assemblage of hybrid elements and actors to pursue a concern as a subject of study. Second, after knowing what to study the question is how to study it, which is inherently a methodological question. Methods are varied; therefore, method is justified based on the topic and the framing of it. *Rhythmanalysis* and ANT are two prominent methods that

4 Said, E. W. 1994. Culture and imperialism. London: Chatto and Windus.

according to authors provide a ground basis for map analysis. Third, mapping and maps are increasingly in every corner of our life, therefore, the "*moments"* of studying mapping is equally an important question. Authors list a series of events and moments which questions when and where mapping studies may be an interesting enquiry of research.

3.2.1 Modes of mapping

Kitchin, Perkins & Dodge (2009) in explaining "*modes of mapping*" and the ways in which maps have been theoretically framed recognise two distinguish strands of scholarships in framing what is cartography: *representational cartography* and *post-representational cartography*. The former, emphasises on cartography as a techno-scientific endeavour to represent as faithfully as possible the spatial arrangements of the surface of the earth. Maps in this account are framed as *truth* (p.4). Cartography as an academic and scientific pursuit, then, seeks to theorise how best to represent and communicate the truth through the medium of maps. This view of objective cartographic science has been challenged by several scholars to show *maps as social construction*.

The latter mode, however, builds on the critical cartography school and seeks to deconstruct the work of spatial representations not just by raising awareness on the political implication of maps, but to rethink the ontological bases for cartography project. *Post-representational cartography*, is series of debate to explore the very "being of maps" and questions "how maps are conceptually framed in order to make sense of the world." (Kitchin, Perkins & Dodge 2009, p.12).

In this tradition, Kitchin, Perkins & Dodge (2009) identify a few ways in which maps are conceptually framed: John Pickles (2004), for instance, attempts to theorise *'maps as inscription'* (such as texts and documents). His analysis based on poststructuralist approach aims to define the ways in which cartography has been naturalised not limited but in relation to practices, institution and discourses. Wood and Fels (2008), like Pickles, extend the notion of 'social construction' of maps and note that "a map does not simply represent the world; it produces the world." (as cited in Kitchin, Perkins & Dodge 2009, p.13). Authors frame '*maps as propositions'. Map in this view is essentially a series of 'posting'* information on the space of the map. In this spatial proposition, maps gain their power through affirmed authority they are assigned into, and passed on to do the work. In analysis of map's 'posting', the authors argue that maps consist of: material and design elements; the discourses associated with design meanings and symbols used; and finally, the circulation of the map.

Maps, in this account, do not have meaning or action on their own; they are part of an assemblage of people, discursive processes and material things that are made by experts. Similarly, maps in Latour's analysis of science in action (1990) is an inscription device that translates reality into set of knowledge-making processes by the experts. Then, the map travels to different offices and desks which it creates controversies as well as consensus that allows every other actor to connect through it. Mapping and maps are, in a sense, assemblages which meanings emerge through socio-spatial practices that mutate with context and is contested and intertextual. Maps in Latour's terminology are *immutable mobiles* (Kitchin, Perkins & Dodge, 2009, p.15). Cartography as an example of how Western knowledge regime gained power and authority in claiming truth based on the culture that was made around the way in which it was practiced and homogenised. Latour (1987) uses cartographic examples to show how assemblage of scientific theories, mapping technologies, and the regime of trade services and disciplines together enabled cartographers to collect data and information from distance and claim truth. He then gives maps the status of immutable mobiles. That is, generic, transferable for of knowledge made unified with standards of signs, symbols, meanings, and rules that made maps to be read in different cultures and in turn be employed to word in the world. Mapping then is transferred to a universal scientific practice. Maps also became mobile and immutable artefacts through which the world can be known and a device in which spatial knowledge can be transported into new contexts (Kitchin, Perkins & Dodge, 2009, p.15).

3.2.2 Mapping agency

John Corner (1999), in his influential essay on the agency of mapping defines mapping as an active agent of cultural intervention (p.217). His enquiry to discover creative methods of mapping and not tracing, leads him to employ Deleuze and Guattari as well as Baudrillard philosophy to identify three essential operations in mapping practices: "first, the creation of a field: the setting of rules and the establishment of a system; second, the extraction: isolation or '*de-territorialisation'* of parts and data; and third, the plotting: the drawing-out, the setting-up of relationships, or the *'re-territorialisation*' of the parts (p.231)." At each stage, choices and judgements are made, with the construing and constructing of the map alternating between processes of accumulation, disassembly and reassembly.

In the same line, Leuenberger and Schnell (2015) study the agency of map in Israel-Palestine territories, as the most controversial land, identity and geopolitics. Authors through a series of map present how maps do not reveal, but produce reality. They con-

clude that maps do not represent, but become inscribed in the landscape; they are not fixed, but are continuously made and re-made. This entails a 'shift from ontology (how things are) to ontogenesis (how things become) – from (secure) representation to (unfolding) practice' … The focus on the practice of mapping reveals that all maps are 'necessarily selective, contingent and contextual … to solve relational, spatial problems'." (p. 805).

Latour's urban wonder through a photographic adventure accompanied with the photographer Emilie Hermant in a web-book "Invisible Paris" (1998) takes the visitor into different layers of the city and networks that make what the city of Paris is about. Throughout the journey authors show the multiplicity of the urban life and spaces that is not visible at a glance. Indeed, it is a journey to Parises within the city of Paris. In this acclaimed Deleuzian adventure (Farías & Blok 2017) Latour points to the map and how it finally makes the whole city visible and how it allows us to build such a scaled city. Maps as reduction of reality which is fed by data, form a network of materials and actors to manage the city from screens in the city management offices. This celebrated work invites the reader to once again question the everyday life of cities and encourages wonders on the semiotic and historical discourses on the urban socio-spatiality and materiality such as infrastructure, maps, buildings, urban furniture and so on.

In a concluding remark, Kitchin, Perkins & Dodge (2009) propose different matters of concerns to study map agency. They refer to mapping as a process and identify ANT terminologies in mapping process including: 'boundary objects', 'centres of calculation', 'inscription devices', 'obligatory points of passage', 'programs of action' and 'trials by strength' through particular actor-networks. From this perspective, the authors conclude that "the stories of mapping always need to be considered as historically contingent actor-networks; as timed, placed, cultured and negotiated; a web of interacting possibilities in which the world is complex and nothing is inevitable (p.16)." Here the focus of map studies is to find out how it is produced and how it produces work in the world.

3.2.3 Maps, knowledge and urban poverty

Urban poverty as a notion is perceived as an urban issue and therefore a problem of planning as such. This framing could also be scrutinised and argued, yet, in this process I am interested to find out how mapping as a technology of planning and indeed means of planning and control come to reassemble the social reality particularly in urban poor areas– the unplanned. Urban poverty has spatial and geographical meaning which is defined by socio-economic data. Every data driven definition is limited to its capacity as a method and performativity of it.

Though, the way in which data is translated into urban poverty involves various selection and classification process. Such process, ANT scholars (e.g. Callon 1995; Winner 1999; Leigh Star 2010) describe as boundary objects. The binaries associated with data driven knowledge making are well discussed in STS programme. However, urban poverty, from planning point of view in this research, refers to set of unplanned areas that for various reasons synthesis growing problems for the people who live there and therefore a threat for the city management. Yet, urban poverty is set to be subjected for planning and a focus for urban planners to study it and make plans for it. In the following, I will describe such a process based on the case study in this research to show how different actors come to form a web of relations in which they make poverty visible from their point of view.

3.3 Mapping practices and map analysis

Mapping practices as a basis for planning has been subject of power exercise historically. However, private and commercial enterprises ranging from web-based software for collaborative mapping projects, open-source mapping applications, Wikipedia, Google Map Maker, and online games increasingly become platforms for shaping and reshaping geopolitical visions (Edwards 2009 as cited in Leuenberger and Schnell 2015). The Internet, in particular, has become a site for various social groups to disseminate 'alternative mappings'. In such an increasingly user-defined mapping environment, it is paramount to investigate the various ways in which maps serve as rhetorical tools that can effectively put forward particular, socially constructed, value-laden, and ideologically charged visions of the world. Yet, maps and mapping for the purpose of planning still follow the same historical trends and could be a n enquiry to reveal hidden relations of sociality and materiality that it aims to address for imagined realities it produces.

The analysis of mapping viewed through the lens of translation of materials-semiotics and the hybrid approach of actor-network theory (ANT) and assemblage thinking demands a set of methodological questions as well. I discussed in this chapter that maps are, on the one hand a central node in the network; one that 'translates' the actual city into a two-dimensional version for which plans can be made. Yet, as ANT stresses, each node is a network which contains different material and social elements as well as actors' relations that go into making and using a map. On the other hand, the map as not only a node, but what ANT theorists (Callon, 1986; Law, 2009) call an '*obligatory passage point*': all actors involved should relate to the map in order to plan. How the map is made therefore has great consequences for how it is used and its prospective use for how it is made. The map analysis in this account focuses on these two dimensions of the map and the way in which it influences the world after it is produced.

3.3.1 Mapping as an analytical method; Situational Analysis

Mapping in a sense is situating enquiries and matters involved in the situation on a relational locus. Such an approach has been in the core enquiry of situational analysis initiated by Clarke (2003; 2005) as a postmodernist turn into grounded theory. I had discussed the core focus and methods of situational analysis in introduction, hence, I take mapping and relational thinking (assemblages) as an analytical method to make connection between the enquiry of this research into a methodological level. Studying of maps and mapping practices demands an understanding of how maps are made and made of. Thus, coming across an analytical method that uses mapping techniques became an immediate interest in exploring it in detail and using it in turn.

Clarke (2005) notes that the postmodern turn in situational analysis was an attempt to go against simplification and action centric approach in grounded theory. Thus, situational analysis tries to embrace the messiness of social worlds by accounting for more elements and discursive negotiations among human and non-human actors in defining the situation of enquiry and finding relations of each. In this light, situational analysis combines theory and method. It provides a theory-method package for researchers to use as a toolkit. From theoretical stand, situational analysis refers to assemblages and the changing nature of conditions. Assemblages in situational analysis language, are temporary/contingent constellations of humans and nonhumans acting together to accomplish a specific set of goals (Clarke and Friese 2007, p.390). Situational analysis, then, introduces three mapping techniques which supports such a way of analysing societal phenomena.

Situational maps and relational maps (Clarke 2005) in practice make the locus of analysis in the situation of enquiry per se. The goal, then, is: first to descriptively lay out the most important human and nonhuman elements in the situation of concern that the research is conceived; be it those which make a difference or even discourses that get silenced. Then, based on the layout the researcher starts to draw lines of relations in between the most important elements in the situation and questioning the nature of the lines and the connection they make. This process goes on and on to bring about different aspects of such relations. Clarke (2005; 20015) provides a set of questions and various ways of coding and writing memos during analysis which I do not go into details here. Yet, I will elaborate and reflect on the experience of using situational analysis in the final chapter which also relates to the very subject of this study– mapping and knowledge making. Though, in the following I use some of the examples of making situational maps in this study to present how mapping as analytical method played a role in this study.

The first step in doing the situational mapping was laying out all the elements in the situation. The figure bellow shows the elements that I identified in the situation. As one can see the situation is so messy and it contains a lot of different things all over the place. At this stage, the questions arose in the analysis were: how to make sense of the situation? What do these elements tell about the situation? And how to categorise them to indicate the most important elements?

Figure 2: Abstract Situational Map

Addressing the mentioned questions, I went through the data and the transcripts repeatedly. Then I started writing memos and adding notes about each element, which it helped me to rethink the situation and draw a more precise understanding of it. In so doing, I used Microsoft Power Point as it offers an easy platform to move the elements around in the text boxes. I used comments options as a way to memoing and adding notes for each one. The speech bubbles next to the codes are the memos that appears in the sidebar. The next step, then, was to categorise the codes once again with the aim of identifying the most important elements in the situation of enquiry.

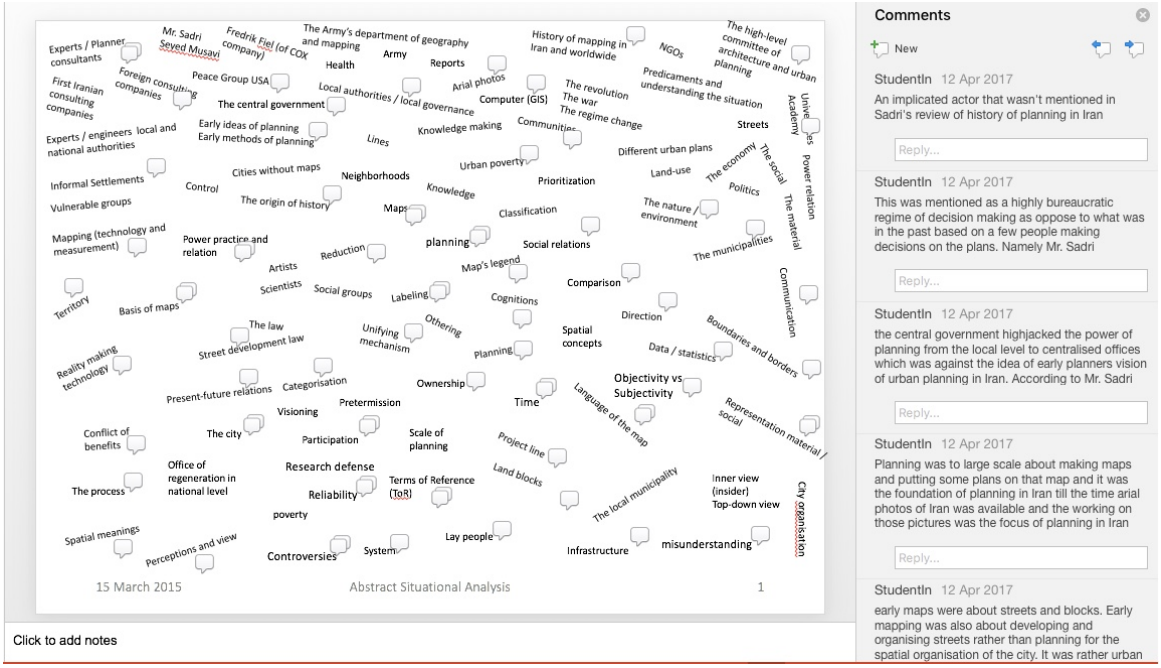


Figure 3: Writing memos on the abstract situational map

The figure below shows the most important elements in the situation. In making this map I also employed the ordered map in the SA. The ordered map is rather a table for all the elements based on the different characteristics they have such as: human/non-human, discursive/semiotic, political/economical, technical/social and so on and so forth. The map below is the most important elements in the situation which is the basis for drawing lines and defining the relations.

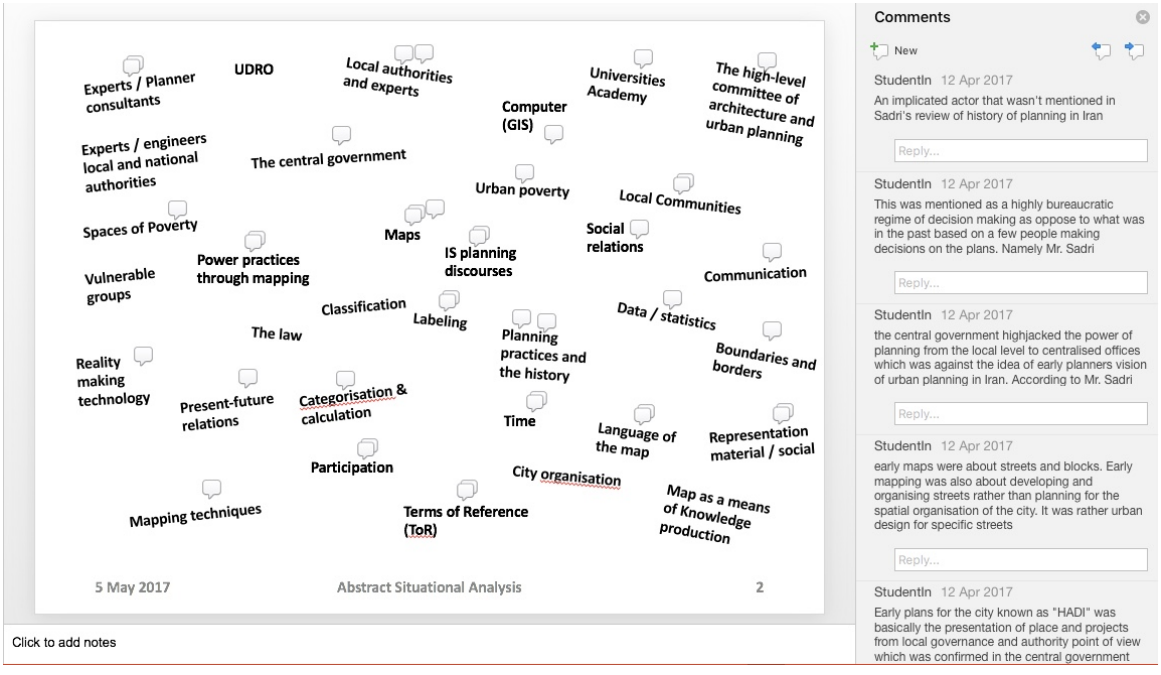


Figure 4: The most important elements in the situational map

The next figure is an example of the relational mapping used in this study. The map shows the relations between the maps as a crucial element in the research with the other actors or elements. Thinking about the nature of the relations and the lines helped me to write analytically and theoretically about the situation while addressing the research questions. However, this method had some restrictions which I get back to it in the conclusion chapter.

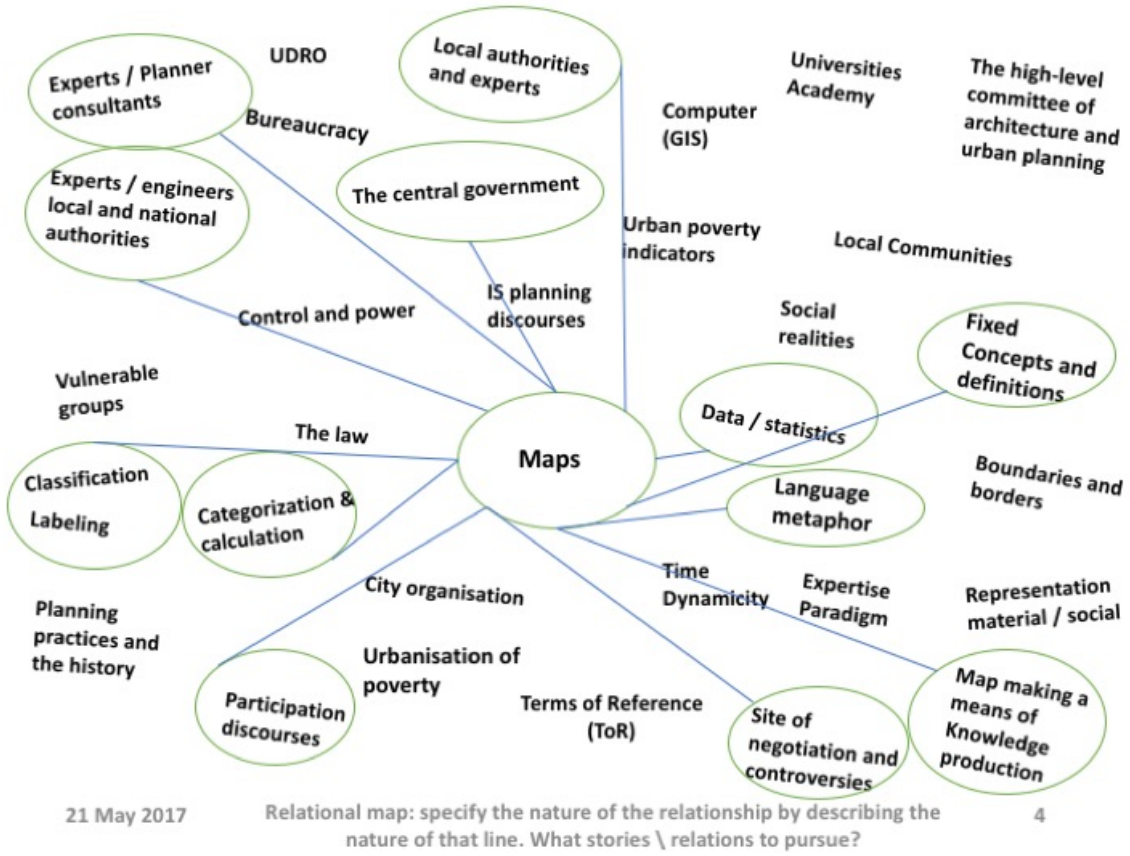


Figure 5: Relational map with focus on maps as a crucial element

3.4 Focus Group Discussion

In an attempt to examine the process of mapping in regeneration planning, I invited a group of consultants and experts who were involved with the regeneration planning of Jiroft City to discuss the process with them and ask them about mapping and planning in Jiroft's context. To shift the focus beyond the consultants' sole insight of the process, I also invited experts from the governmental agency in charge of regeneration programmes (UDRO), as well as two researchers with sociology and economic background to participate in the discussion and bring a more in depth dialogue in the group. In the following chapters I will describe the focus group setting and its findings as a space of knowledge making. The narrative chosen to describe the process is based on four sub-

questions mentioned in the introduction. That is to say: who makes the map, and how? What's the purpose of the map, and why? Then I will analyse how do maps produce knowledge? What do maps show and don't?

The focus group discussion took place in the consultancy's studio. Six participants attended the discussion, all of them experts in different fields related to urban planning and regeneration of urban poverty. The discussion lasted for almost 3.5 hours which I recorded the voice and transcribe the material afterwards. I started the session by explaining the research project and the focus of the study. Then participants introduced themselves and explained their background to the group and how they were involved with Jiroft project or the city, if at all. Three of the participants were directly involved with the project (two from the consultancy and one of the experts from UDRO) two other participants had experience of working in Jiroft in projects related to urban poverty but not directly in the regeneration planning.

The session had two separate parts. In the first round, I asked the participants some simple questions on the role of the map and mapping in their experience to find out how they view mapping in their own experience. The questions I posed were: what is a map? How does it produce knowledge? What is the purpose of the map? What is the relation of the map with planning? How does mapping play a role in regeneration projects? Who are the actors involved in the process? How does the map get produced? And how does it produce effects? The overall flow of how planning and maps are interlinked was agreed among the group as a simple relation of: Data → Analysis (knowledge making) → Mapmaking → Knowledge produced and reflected on the map → Maps as texts for decision making → Maps finally become official documents for the city management and basis for implementation.

In the second round, the participants collectively reviewed a series of maps from Jiroft regeneration project. We debated different aspects of mapmaking and map presentation together. The questions that guided the debate included: what does the map tell us and don't? Discussions in the second part created a space for criticising maps and mapmaking in the group. Obviously, the consultants and the UDRO expert had to defend their work and address the challenges, which led to an interesting coalition between them. In the following I provide an overview of the flow of debates in the FGD and its findings.

However, before starting the discussion chapter I should reflect on my own role in relation to the focus group as well as to the consulting company. This is indeed a hard task of self-reflection or a kind of auto-ethnography. I hope influences by the STS enterprise guides me through this mission. In describing my role, I will reflect on how the consul-

tancy as a space of knowledge creation functions; who are the experts in charge of regeneration planning; how mapmaking technology influences the process. Some of the description in this section comes from my own experience of working in this field and not from the fieldwork that I had conducted for this research. It is indeed a performative process in both doing a research and in any urban of planning practice.

In so doing, I explain how the urban regeneration process works in a nutshell. This is partly drawn from my own experience of working in similar projects as well as analysis of the contract and the terms of reference (ToR) as a reference point that explains the structure of regeneration programme for the consultants. By describing the process, I focus on mapping practices in Jiroft project and how mapping reflects and produces urban poverty assemblages.

Chapter 4 Mapmaking in Jiroft regeneration programme

> "What do you consider the largest map that would be really useful?"
>
> "About six inches to the mile."
>
> "Only six inches!" exclaimed Mein Herr. "We very soon got to six yards to the mile. Then we tried a hundred yards to the mile. And then came the grandest idea of all! We actually made a map of the country on the scale of a mile to the mile!"
>
> "Have you used it much?" I enquired.
>
> "It has never been spread out, yet," said Mein Herr: "the farmers objected: they said it would cover the whole country and shut out the sunlight! So we now use the country itself, as its own map, and I assure you it does nearly as well."
>
> Lewis Carroll (1893), "Sylvie and Bruno Concluded".

Previously, I discussed different theoretical and methodological approaches in relational thinking and the enterprise of urban assemblages that focuses on mapping and planning from an STS point of view. I have also showed how mapping as a device (technology) is embodied in planning processes and in the making of urban societies. I argued how mapping is not mere representation of the urban environment, but a process in which data is translated into knowledge and finally visualised geographically on the map. Hence, the map produces realities as well as reflects what the planners aim for–the purpose of mapping.

Here, I will move to the empirical focus of the study and the findings of the fieldwork conducted for this study. I describe analytically the case study to explain what is the situation and what are the main actors in the process of regeneration planning in Iran. Re-

sources that the findings derive from are the FGD, the ToR and notes from reading of Sadri's book (2015) "The Genealogy of Urban Scheming (Planning) in Contemporary Iran[5] (my translation)". In so doing, I first provide a brief history of urban planning in Iran as it was narrated by Sadri in his book and in the FGD. This brief narrative shows the role of mapping in relation to planning and how it developed since 1960's in Iran. Then, I present the most important actors and actants that make the map in almost every planning practice but specifically in regeneration projects in Iran. That is to say: what are the actor-networks of mapping in the case of Jiroft regeneration project? How maps are then made? And what is the purpose of mapping? The purpose of mapping and planning as one of the core focus of this study shows interesting relations among other actors in the network which justifies the action in first place. Yet, the purpose is meaningless without forming specific networks of materials and semiotics that make the map come to reality and in turn make new ones.

4.1 Mapping urban planning in Iran; a brief history

I have mentioned that Sadri's role in the recent development of urban planning in Iran. His knowledge and experience guide the narrative of urban planning history in Iran in this study. His story of how planning and mapping provides a deep insight into understanding both the relationship and the entanglement of mapping and planning in Iran. He, in his book, argues that modern history of planning in Iran started by the 'urban road development law' dated in 1968. This law gave mission to all the municipalities to develop a network of roads in the existing urban fabrics and implement it based on the plans they had to prepare and verify by the Interior Ministry. Streets in this era were the most important modern urban element which allowed cars to move in and out of the city and speed up development accordingly. This paradigm shift was guided and influenced by European models of urban development. He adds that: "All the cities were trying hard to look like European cities and the central government put a major force in making it. To reach this goal, the Interior Ministry had hired foreign consultants to lead and guide planning processes in Iran (Sadri 2015, p.32 – my translation)."

The early practices of planning in Iran, thus, only aimed to draw new streets and reorganise land plots as modernisation of cities in Iran [Sadri 00:43]. Drawing lines on what Sadri calls 'the basic map of the city' aimed to transform cities to new modern grid logic forms. This opened space for a better accessibility and allowed cars as modern vehicles of

[5] The original title of the book in case for those who read Farsi is:
تحولات طرح‌ریزی شهری ایران در دوران معاصر. مؤلف بهرام فریور صدری. انتشارات آذرخش. سال ۱۳۹۳

mobility to become the new means of transportation. The basic maps of cities only showed the view and the location of streets in the city, as well as some basic information like names and landmarks. Meanwhile, in the late 1960's the army's geographical department set up a technology for taking aerial pictures of Iran, which revolutionised the view of the city since. Those images which was first published in 1968 provided a new basis for mapping cities and looking at them from above angle with a lot of details inside and outside of urban blocks [Sadri 00:45].

In fact, the beginning of planning in Iran was mainly making maps. The plan, thus, was only the map that with propositions in a form of lines on the existing structure of urban blocks with the aim for new spatial organisation of the city based on new streets. The map also provided recommendations for the municipalities in a form of regulations which was written as guidelines on how to take the map into action. I specifically raised this point and asked Sadri to explain whether maps and plans were the same thing at the early times of planning in Iran and he replied:

> "They came along and together, yet, the language of planning was the map. Planning didn't have similar meanings as it does today. Planning back then; only focused on spatial organization of cities, meaning it didn't take into consideration the social, demography, economics, the environment so on and forth. Only spatial aspects: [such as] where is the city boundary's development? Where was it before and where is it now? Where is the boarder that the municipality provides services? And so on." [Sadri 1:03].

4.1.1 The relation of the map and planning in Iran

Maps relation to planning came up again and again in all the discussion as a lingual metaphor. Language in mapping points to a set of goals that defines the map purpose and represents what is the map. The aim varies based on what the map is trying to project as a knowledge of the place. Then, maps propose actions that are planned for addressing the aim and the planning programme. The early practices of mapping and planning as Sadri explains only dealt with spatial organisation of cities. Here, two questions arise: how the socio-economic life of the city was managed then? And how decisions were made for impoverished areas in the city?

Sadri finds this relation as local the governance model, which defines the relation of municipalities with citizens and vice versa. Municipalities as the local governments oversee providing services for the citizens which included socio-economic improvement plans. Sadri mentioned reminded an old theme of municipalities to support impoverished

communities: "For example, '*Ebm-e Sabil*' was a scheme that municipalities had to provide financial supports for the poor as well as making affordable houses for people in need. However, the role of planners was to make all that into spatial dimension and projecting it on the map [Sadri 01:15]." This governance model became the foundation of planning in Iran. That is, what Sadri calls: '*scheming'* (*Tarh Rizi*)[6] rather than planning. Such process started by mapping, because the tool for planners to communicate with municipalities was (still is) the map. In this regard, planner draw plans on the map and gave it to the municipality. Sadri summarises the whole process back then as: "…Planners' job in a nutshell involved defining and designing projects for the city, and then giving them to the municipality to conduct it. The produced map was the plan. The plan [back then] did not have much details on it. It was literary only the map and nothing came with it like reports. It was simple and direct; not like what urban planning is about today. The only detail on the maps were priorities of conducting the projects and the rest was the municipalities to decide how to make it happen [Sadri 01:07]." Maps and plans, therefore, come together and in relation to one another. Although, this is an early example of the relation of mapping and planning, but the take away here is that the map is the language of planning and a tool for communication between planners and municipalities.

4.1.2 The logic and the language of the map

Maps and mapmaking from the early phase is related to what is the purpose of the map. The purpose holds and forms concepts and ideas behind the map. Regeneration programme and planning for it explains the function of the map in Jiroft project. In this light, language is the key metaphor that Sadri uses to explain why the map is made, what is it trying to or to say. Thought, the language of the map is in his terminology the technical expertise of mapmaking in urban planning. He describes the language of the map in relation to the scale of the map and the concepts behind the purpose of making the map. Based on the purpose and the scale of the map, then the planner looks at the city from different angle zooming in and out. The broader the concepts the bigger the scale. Therefore, the language of the map is the reflection of the purpose of planning, the concepts of planning, the subject of planning and the scale of planning. Sadri gave an example to show how scale and language of the map are interlinked: "…. For instance, when we want to map the metropolitan area of Tehran, land use maps become meaningless. In that scale, we only can show zoning of the city and therefore the way in which we make the map changes, because the concepts change in that scale." [Sadri 02:08:03].

[6] طرح ریزی

Such language, however, is constructed as the view of planners and planning regime throughout the history of planning and mapping in Iran. Yet, the logic of the map and the view of planner are entangled with the purpose and the function of the map. However, this explains only the overall idea behind the mapmaking. In the next section I explicitly elaborate on different elements, groups, actors and actants involved in the making of maps in the context of Jiroft regeneration programme. The analysis, however, focuses on the relations of each elements to one another and to the overall situation. All this in the end attempts to theorise the mapmaking process in Jiroft regeneration programme by applying ANT view and the ways in which ANT helps to formulate mapmaking.

4.1.3 The genesis of regeneration programmes in Iran

As we saw it above, the early urban planning practices worked simply and with few agents involved. Sadri's early experience of getting involved with urban planning in Iran goes back in the 60's, where only a group of people at the ministry of interior worked on the newly established urban planning section. Sadri in explain how was the work done back then described that: "The first thing we would do was to buy aerial photos of cities and or if available the city's map from the Army Geographical Department. Then we designed and drew specific plans on the images and the maps which made the planning document for that city [Sadri 01:12]." Ironically, the bureaucracy of approval for such a plan included only the signature of the head of the team which was the supervisor of the group of graduates who worked in the department of Municipalities Affairs at the Interior Ministry. The group only had five to seven members.

Sadri talks about the old times as if everything was so straight forward and direct to the practicality of how to think about the city and how to plan it for solely implementation purpose. He mentions that urban planning, or in his terminology '*urban scheming*', changed over time and turned into more and more detailed planning that includes different aspect of the city. The first and a major shift was master planning for big cities, which was influenced by 'the Marshal Plan' and similar European and American agendas for redevelopment of cities after the second world war (Sadri 2015). Here a postcolonial moment arises to question the traveling and the translation process of new agendas; and the emergence of new institutions of power in Iran's context. Even in the new paradigm of poverty eradication in the framework of urban regeneration programmes; the initiation of such programme took place in collaboration between MRUD and the World Bank. It is also interesting to note that the title of the programme also changed over time more than three times. It started by upgrading of slums, then slums became a passive labelling for urban neighbourhoods [Kamal, the participants in the FGD from UDRO] so it was

changed to revitalisation and rehabilitation of informal settlements, and finally since 2012 after the presidency election (Rouhani's election as the president), the new administration introduced the term regeneration as the theme for dealing with poverty. Subsequently, UDRO's new managerial board prepared a new policy document which came with new contract format and new ToR's which defines the agenda and the goals of regeneration programme. This document is approved and ratified by the government administration and the parliament.

Though, I step away from this highly interesting moments of postcolonial relations in the making of expertise (see Mitchel 2002), as well as, the political construction of poverty in Iran; so that I keep the focus on the regeneration programme in Iran as a political agenda for poverty eradication, which also has its own interesting story. To understand how does regeneration programmes work in Iran; I present analytically the ToR used in Jiroft regeneration programme signed in 2013, and the ways this document describes regeneration programme. In addition, I use some quotes from the participants in the FGD which presents the lived experience of experts involved in Jiroft regeneration programme and or elsewhere in Iran.

4.2 Regeneration programmes on paper and in practice

As I mentioned before, UDRO is the main office in charge of preparing regeneration programmes for different cities on the national level. The main reference point between the consultancy and UDRO is the contract and the ToR, which defines the process as well as the expected results. The contract specifies five levels in which a series of reports and maps are produced. Each level must be verified by the respective authorities, so that the study can go along and the consultant gets the permission to enter the next level.

One of the objectives of regeneration programmes, as mentioned in the ToR, is to make a database for understanding and quantitative as well as qualitative analysis of informal settlements in the target city. This database is then used in the research process to be the basis of policymaking and decision-making regarding improvement of conditions in those areas. The database, therefore, should gather the most updated information of the city from the national census, other urban planning programmes, the local authorities, observations in the field as well as information gathered from local citizens.

The database also has the character of the whole regeneration programme, which is built and developed step by step. The participants in the FGD described the process of preparing the database in five steps. First, the purpose of making maps is defined in the ToR within the framework of regeneration goals and objectives. Second, data and statistics

from different sources (mainly the national census) as well as survey conducted by the consultants is collected and stored in a GIS based database. Third, the basis map is bought from army's geography department which provides the ground for mapping in GIS software. Forth, additional geographical images such as aerial images (mainly Google Earth imageries, which has the advantage of being free and having images from different times that shows the trend of changes in the city) as well as observations in the field is added as an extra layer in the GIS platform. Finally, analysis of data and other information creates a knowledge of the place which becomes the basis for suggesting plans and designing projects as the outcome of the regeneration programme.

Another important characteristic of the ToR is that, in general, it emphasises on the importance of participation of local communities and local city management authorities in having a hand in the planning. The term 'planning with the people' is used in the ToR as the approach in regeneration planning to bold the role of public participation. I will get to this aspect of regeneration programmes later to show how did the citizens participate in practice in Jiroft regeneration programme project.

In the following, I describe regeneration projects within the five levels indicated in the ToR. In so doing, I first focus on the process of identifying informal settlements areas/neighbourhoods in Jiroft City as it is not just the first phase but it is a crucial step in framing and embodying urban poverty in regeneration programmes by the means of mapmaking. Then I briefly point to the regeneration process after the target areas are identified. Next, I explicitly elaborate on the type of maps in regeneration programmes as well as showing how they are made. Finally, in this section I draws conclusions on the general logic of the map and mapmaking in Jiroft City.

4.2.1 Identification of informal settlements in Jiroft City

In the early stage, the main aim is to identify and prioritise the target areas for regeneration planning based on socio-economic, spatial and environmental criteria. This is the crucial part of the work as it indicates the focus of the planning. At this point, the work involves a series of internal meetings with experts in and out of studio. The outcome of the meetings includes: coming up with a list of data and information each expert needs for his/her work. After collecting all the available data and putting it into GIS database software, then the team discusses the criteria and indicators of poverty in the city. Series of debate take place. Each expert based on his/her speciality discusses what are the important elements that translate data into poverty and represents poverty in the city. The overall results translate data into poverty as a notion, then it is visualised on the map to

show geographical distribution of poverty in the city. In another word, the map makes poverty visible in the city based on translation of data into meanings (poverty explicitly) and combining it together as a final geographical location.

To explain it concretely, the process applies looking at the whole city and analysing the defined set of criteria that translates data into poverty index. The poverty index, as suggested in the ToR is divided into four main categories: ***societal, economic, spatial, and environmental***. In Jiroft project the index included: 1. *Societal factors*: demographic pyramid shape, mortality rates, number of children and elders, population density, the size of a household, crime rate in the area, literacy rate and so on; 2. *Economic factors*: income, employment, living costs and rent/land price; 3. *Spatial factors* get more in detail: the size of houses, number of houses in an urban block, quality of housing, materiality of houses, infrastructure, accessibility to services, number of urban facilities in relation to the area such as schools, hospitals, parks and so on; 4. *Environmental factors* are slightly different, since they are not all translated into numbers: environmental risks (particularly hazardous threats such as being near a river or on an earthquake fault line), quality of drinking water and sanitation which are not data but based on observation and information taken from local authorities. The main source of data is the national census that is collected every five years.

All the numbers are then compared with the city's average rate. Therefore, each index has different factors that come to indicate the less mighty areas, but they are not equally valued. The next step is to give them a relativity rate on how it plays a role according to the experts' opinion which is negotiated in group meetings. One of the experts in the focus group discussion explained that when the contract is signed, an initial meeting with the local authority is arranged. The aim of the meeting is to introduce the consultancy to the city management board and explain the aim of the project as well as the kind of collaboration that is needed between different parties. During this time, a field visit is done, so that the consultants would get to know the city and observe some of the poor neighbourhoods. The visit is usually guided by some experts from the municipality. The municipality is the main recipient of the project, therefore, has a strong influence on the process as well as the outcome.

The experts, then, have two distinct source of information on the condition of the poverty in the city: 1. the national census and 2. field observations and local knowledge of the city. These two sources come along and in encounter with each other as explained by the participants. Basically, the impression for this phase of regeneration planning is that: the process of indicating and prioritising the target areas must take place to legitimise the

existing knowledge of the place [Kamal, Meisam and Sadri]. Yet, the experts in this process have their own way of manipulating data and the result, so that the data would meet expectations of the municipality.

It is evident that the municipality has a comprehensive and detail understanding of the situation in the city regarding the main issues and the status quo of urban poverty, which the consultants as well as participants from UDRO acknowledged it as an important fact. Albeit, the maps produced by the consultants do not match with what municipal experts already know, then the result must be negotiated in the decision-making committee. Consultant's experts however have their own way of reconfiguring the data and the way it is situated in poverty index. For instance, each of the poverty index can be given weight so that they play a stronger role in the indication project. This gives the consultants a power to change and manipulate data to fit best the observational sources as well as the lived knowledge of municipality's experts. Yet, it is also a hybrid nature of planning and the agency given to the local authorities to have an active engagement in the process of regeneration. Participants in the FGD raised the importance of making a good relationship with the municipality as a key to success in the project. The ToR, also, explicitly emphasises the role of local authorities and obliges the consultants to build a productive relationship with local stakeholders in the process.

The next level after identification of target areas, which is approved by the respective committee, is to study the features and the conditions of each area according to official documents and surveying the neighbourhoods. Here, a new set of data is collected and mapped to present new knowledge of each target area. Consultants, in this process, produce knowledge that is projected on maps and mapping is visualisation of the knowledge on the city.

The rest of the process goes on in the second level which is: predicaments and priorities in the target areas according to city official documents and local authorities' knowledge and information. In the third level, needs and priorities of citizens in the target areas are collected in participation with local communities and active groups (religious groups, NGOs, etc.). Fourth level is about designing and planning for reorganisation and redevelopment of the target areas. Finally, in the fifth level, experts provide programmes for empowerment for both city management authorities and the local communities in collaboration with active groups, the out of this level which is partly the outcome of the programme is the action plan for regeneration of target areas.

In summary, this is an overall view of how the regeneration process works in and out of the studio. There are many factors involved in the process which describing them would

take a long explanation. The aim was to inform the reader on how is the process looks like. Purpose of mapping and mapmakers are central agencies that shape the way in which the map participates in reassembling urban poverty. The map then as a production of mapping ends in the hand of recipients, which is yet a beginning of another network of actors that has different effects and readings. None of these headings are precedence to the other nor are independent, but all interlinked to one another and to the other networks and assemblages.

4.2.2 Enactment of poverty from the distance

Hybridity in this process is matter of translation of data to a reality which meets expectations of the municipality and the expert's lived knowledge. This also points to the fact that there is wide gap between the knowledge that is made in the urban studio in Tehran and the actual place in Jiroft which is far away. Consultants make their own knowledge of the city only through the imaginary that they draw based on data and existing maps. Also, the field visit they go for. Then they make their own maps that presents knowledge of the place and the status que of poverty in Jiroft. Maps, here, are space for communication and negotiation between the knowledge created in Tehran and the local knowledge of the city.

Maps come to be projection of already existing knowledge, which do not say the same thing necessarily. Maps are representation of the reality which is not the reality of the people who live and work there, but an interpretation of it for the purpose of making a new set of realities. Maps make knowledge of the place visible to other actors and call for further negotiation and action. Mapping, in this sense, is an inscription apparatus that draws upon the world, but also draws things together (Latour 1990; Kitchin, Perkins & Dodge 2009). So, mapping is constructing poverty as social formation. Poverty then is enacted in maps and by the ways in which maps are made.

The method and the practice of making maps reflected in Jiroft project has interesting character of performativity. Later in the next chapter, I explicitly explain such a performance. Here, the expertise methods reflect specific realities distracted from data and information in time and space. Hence, it is not fixed in the way it constructs the method of identifying poverty. The local authority as influential actors with their political power reconstruct the expert's method by the specific corporeal experience they have combined with the power to stablish their view co-construct poverty as a new social reality of the place. No doubt those neighbourhoods have their own problems but since mapping in regeneration framework constructs a new socio-political reality in the place by labelling them as informal settlements or regeneration target areas, the identity of the place

changes at least from official point of view Such performance and the new for those areas introduce new possibilities of change and calls attention for new actions with new agenda supported by plans and projects within the framework of regeneration prepared and made by the planners. As such, mapping involves remapping; making and use can never be separated (Perkins 2009). Thus, maps in Jiroft regeneration, as any other map, are crossing the distance in between the actual place, the lived knowledge of municipal experts in Jiroft combining it with the consultancy's knowledge making practice to the eye of the central government. Poverty is enacted and made into a formal matter in the constellation of different agencies in the making of it; all in different locations.

4.2.3 Maps in regeneration programme

The whole process of planning in regeneration programmes in the end should at least present thirteen maps that supports reports and analysis of urban poverty. The ToR lists the title of the maps which the all go into the map volume. Below is the list of the thirteen maps:

- Map of urban land use of the city;
- Map of poverty index and its distribution in the city;
- Map of location of informal settlements in the city;
- Map of existing urban services and facilities in and around informal settlements;
- Map of location of prioritised target neighbourhoods approved by the city committee;
- Map of urban land use of the target neighbourhoods;
- Map of spatial organisation of target areas and the idiom of development for each neighbourhood;
- Map of property ownership in the target areas;
- Map of land price and house price in the target areas;
- Map of quality of houses in the target areas;
- Final map of the detailed planning and its recommendations for target areas;
- Map of proposed projects for target areas;
- Map of contrariety between detailed planning and regeneration programme.

These titles represent the purpose of the maps and guides the planning process in regeneration programmes. Though, the basis of making these maps are all the GIS database. The GIS database holds every piece of information regarding the city including: the basic maps of the city, the aerial photos and so on. After the basic map and the existing data are collected and put into GIS database, then it gives all the tools and options to the con-

sultants to categorise, combine, analyse, manipulate and produce maps. The process is usually explained in the reports.

During the FDG the map volume was in the centre of the discussion table, which the participants collectively reviewed them and decided to discuss the most important ones. The experts from the consulting company as well as Kamal of the UDRO explained the maps in the discussion and the rest of the participants (including myself as the moderator) raised questions and asked about different aspects of the maps. In the next chapter I will elaborate more on that. Yet, I explore how participants explained the process of map making in the Jiroft project.

4.2.4 Mapmaking from early planning practices to Jiroft regeneration project

In the beginning of the FDG, Kamal explained the different methods of mapping in cartographic sciences. He mentioned two main methods of mapping for the basic map. One is that it assumes the earth as a flat surface and measures the land and indicates landmarks and boundaries on the map. The other method sees the earth as a sphere and draws information on it the surface with detailed attention. Cadastral maps follow the first method based on aerial images which is already flattened. Based maps of cities in Iran, he added, are all cadastral maps. The difference between the two methods is in the detailed information that each one provide. Cadastral maps only show streets and land blocks, whereas the second one shows the boundaries of each plot of land.

The early maps of cities available in Iran were all Cadastral maps. Sadri explained the early maps and the kind of information on them saying: “the foreign consultants usually drew the map for development of new infrastructure for the city, for instance water supply, sewage systems, electricity and so on. Those maps became the first source of geographical information for our cities, which urban planners later took on and used for planning purposes [Sadri 1:10].” Though, it is interesting to notice that the early geographical maps produced in Iran had very different purpose. Yet, the planners picked them up, partly because they did not have another choice, and used the maps for new purposes. Clearly, the information available on the early maps were limited to the purpose they followed, hence, they were the best available geographical information for the urban planners.

Once more, mapping in relation to planning is the state’s intention to intervene in the city. Planners hired by the state obviously serve their purpose. However, Kamal thinks this role has changed. He mentioned that: “In recent history of planning the role of planners became more like a moderator in-between state and citizens. This change has effect-

ed the role of maps in turn. Nowadays, discourses on bottom-up planning and participatory approaches, as a new paradigm for planning, looks at maps in different ways. Citizens here have more a say by providing information and new layers of data into maps. Therefore, new forms of maps appear, thus, the map as a tool changes [Kamal 01: 18:]." He later added trying to relate his claim to Jiroft saying that: "Jiroft project as an example in today's discussion represents how Sharestan consultants go to the field and collect citizens' knowledge and opinions to indicate their priorities. As a result, one of the maps that is made in the project is the map of 'spatial organization of the neighbourhoods' or 'the idiom of development for neighbourhoods' which is very different from classical maps that only projects the land use and facilities, to a new dimension of maps that shows the relation of space production, and different actors' role in making the space. It is a very different result in making a map. In this sense, the map although just shows the projects that are defined as a result, but it consists of a process that how it ended up being here with participation of the citizens [Kamal 01:20]." Below maps are examples of the difference that he mentioned as in the masterplan of Jiroft and the spatial organisation map produced in regeneration programme.

The map on the top is the masterplan map of Jiroft City. Colours on the map represent proposed land use for the city which becomes the official title for the land plot. The suggestions are based on shortage of urban services including schools and hospitals that should be built to support the population growth in the city in the future. The map on the bottom, though, shows the proposed projects for one of the target areas in Jiroft. The arrows show the main streets in the neighbourhood and suggests investment for redevelopment of the streets to become commercial lines. The stars on the map propose building of neighbourhood centre with space for including urban services. In the masterplan, land use is fixed and based on statistical data and urban distribution, therefore, citizens have no agency in making of it. Whereas, the other map only presents suggestions for making the neighbourhood livelier and nothing is fixed on it, meaning it does not propose land use for the land plot and leaves space for further consideration. Also, citizens were involved in identifying what are the priorities of the neighbourhood.

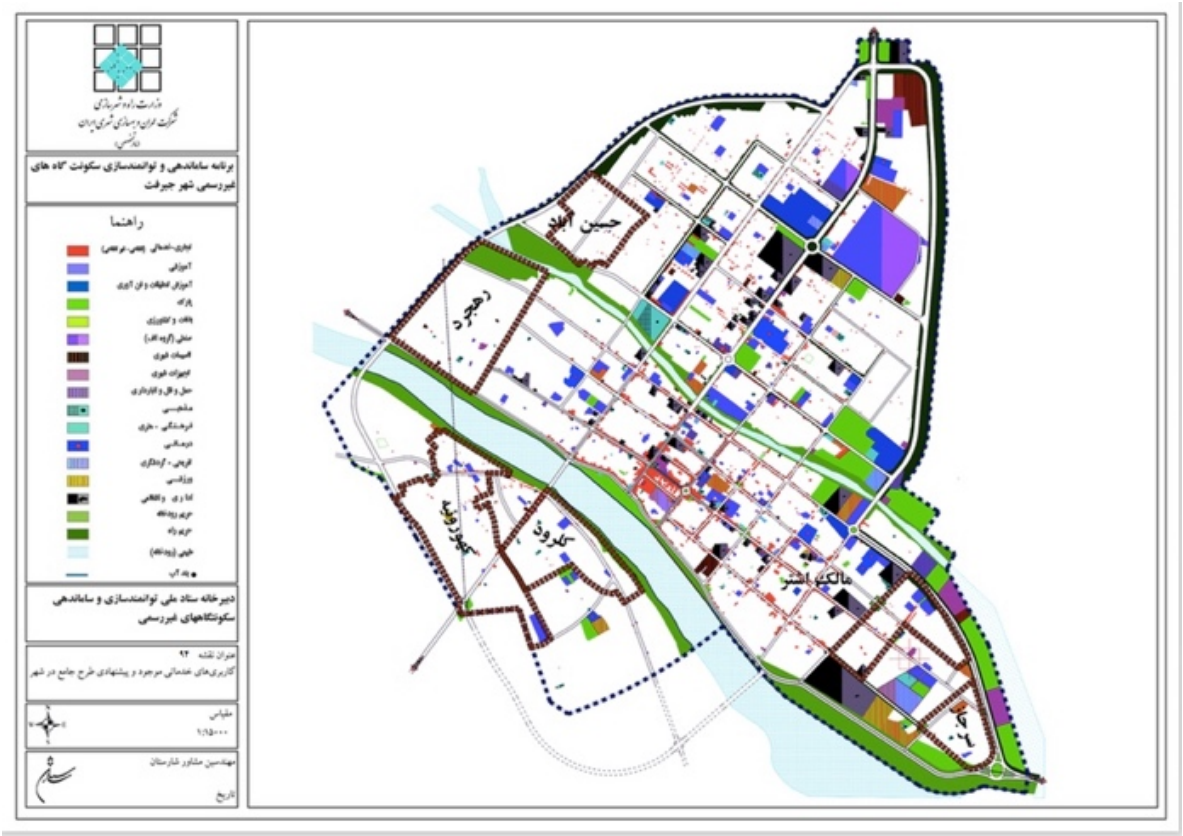


Figure 6: The map of distribution of services in Jiroft and land use suggestions for the future in the masterplan of Jiroft City (2014)

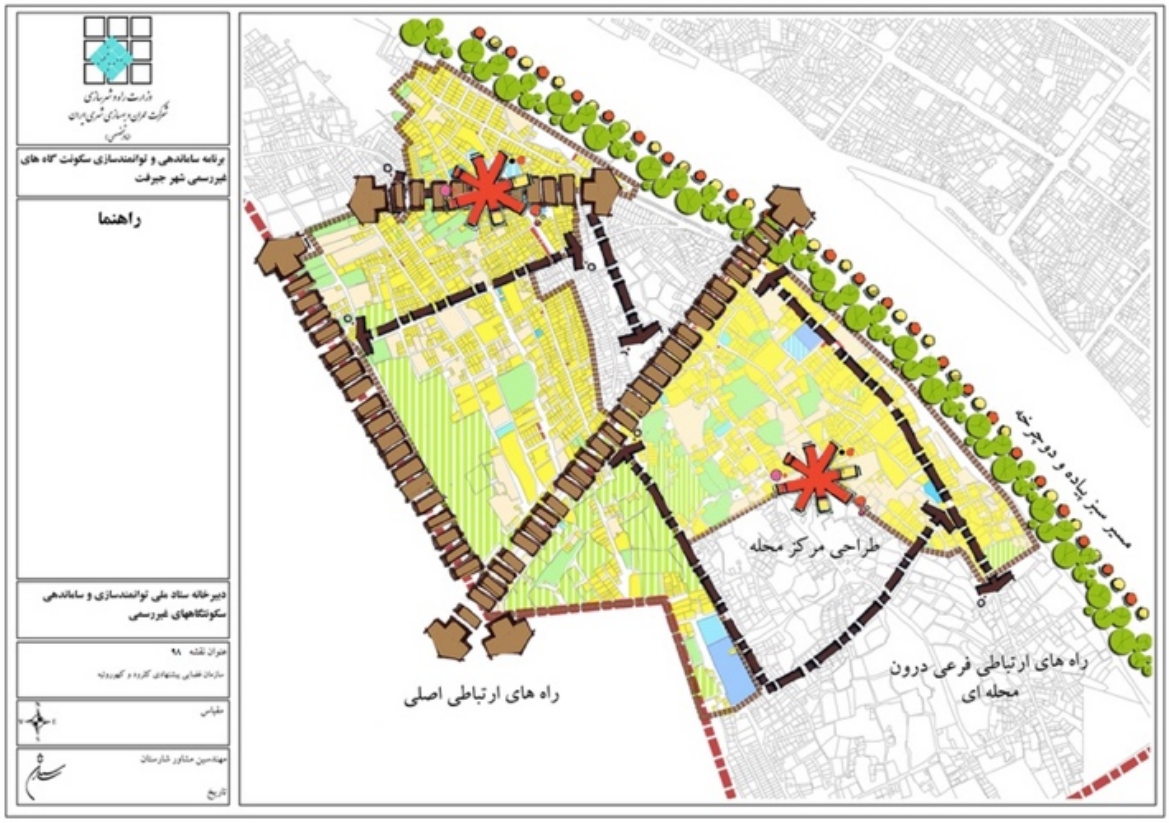


Figure 7: Proposed spatial organisation of Kalrud and Kahuroyeh (two target neighbourhoods) in Jiroft regeneration planning project

4.2.5 Collecting data as an approach in the making of maps

Reflecting on the ways in which maps are made in regeneration projects, I try to explain the role of the map in the new paradigm of participatory planning. Though, taking citizen's participation for granted seems a little naïve and misleading. Foucault in his dialectical analysis of knowledge and power states that 'space is fundamental in any exercise of power' (Foucault 1967, p.24) and that it is inconceivable that we "leave people in slums, thinking that they can simply exercise their right there." For him architecture and city planning are inherently political act, thus any technicians of space, in order to realise liberation, must align their purpose with the practices of people. This Foucauldian emphasis on space making opens a dialectic that is ignored historically by power and with UDRO in Jiroft context. Thus, claiming regeneration maps are liberating exercises based on the approach that consultants took in making such maps would miss the symmetry of the social.

Following Kamal's statement on the unique character of mapping in Jiroft as a participatory appraoch, a question regarding the level of participation and the role of participation was raised by Payam, the sociologist and the economist, asking: "how did the citizens or even the local authorities have a hand in making of the map?" The answer implicitly was: "giving/sharing information." That means the local actors are a source of data with no agency in making the map. The consultants, although try to approach the source of data based on the local knowledge, but the process of selection and making of maps is solely done by consultants. Payam pointed to this fact saying: "[…] the act of representation always comes with a selection process, which deliberately or not, put few things aside and emphasises on few others. That is a power practice [Payam 01:33]." His statement was a reaction against Kamal, who tried to distinguish regeneration programmes from other planning practices by making participation bold and in the heart of the planning approach in regeneration programmes. It is interesting to observe that how collecting data in participation with local stakeholders shapes the approach of regeneration programmes and the function of the map. No matter how the data is collected and/or created, it passes through the hands and technical expertise of mapmakers in the consultancy. Therefore, participation is rather matter of an approach in collecting data or considering local knowledge as valid source of data. However, the question is how even such participation in collecting data made a difference in the making of maps in Jirfor?

This question was raised in the FGD to see how such process, or in fact any process, is reflected on the map. Sadri in respond to Payam's question of "is the outcome of this specific project is the same as all the other projects but with different approach?" said: "No.

Here it depends on who made the maps which reflects their view of the city and what kind of concepts did the consultant choose." This again points to the agency of planners in making the map and framing the project approach, but it is limited to the scope of their work and the ToR they perform based on. Basically, the view of the city is emanated from the view of those who make it. The approach therefore in making maps is largely regarded as the way in which the data is collected, not how the map is made and who has defined the concepts and the purpose of the map. The ToR and the contract determine the outcomes to great extent. Though, the language as Sadri puts it is different. Analysing the map and its constellation, discursively and metaphorically, demands an understanding of the map and its lingual expression in the visual presentation of the map. Such understanding and analysis has been in the centre of attention in ANT scholarship in deconstructing any knowledge making practice. In the next section, I look into how ANT aids studying maps with reference to Jiroft project.

4.3 Deconstructing mapping in regeneration projects; an ANT view

At this point, I view mapping process from a critical and analytical view once again to deconstruct mapping in Jiroft regeneration project. Earlier, I discussed different relations associated with mapping practice in regeneration planning. In fact, I identified various elements in the context of the study including: the history of planning and mapping in Iran, the relation of power and knowledge in the making of maps, maps as a device of planning and finally various ways of analysing maps including ANT and rhythm analysis. Here, I employ ANT and urban assemblages to emphasise on relational thinking and rejection of any prior agency in analysing the process of mapping in regeneration programmes. Subsequently, I identify the most important elements in the mapping practice in Jiroft which is then framed as a translation process (Callon 1986, Latour 1987) in knowledge making.

To start with relational thinking, Situational Analysis method suggests researchers to identify the most important elements in the situation of enquiry (Clarke 2005). Identifying the elements in this case study, I first looked at the map in relation to the city that translates city into numbers and then the process of knowledge making. The published map therefore projects the knowledge of making of the place in the time it was made and by those who made it. In the following, I describe how mapping process is practised in regeneration programme on paper (the ToR) as well as in practice referring to experience of the planners in Jiroft project. Additionally, I employ the celebrated notion of translation in sociological sense to contextualise the mapping process in Jiroft city.

4.3.1 Sociology of translation in Jiroft's mapping practice

Callon (1986) famously explains translation process within four crucial moments that builds and/or changes a network: *problematisation*, *interessement*, *enrolment*, and *mobilisation*. Latour (1987), similarly refers to translation process to discern scientists attempts to transform reality\facts to knowledge and innovating new artefacts. Below is the summary of each moment in translation process:

- *Problematisation* can be defined as the first moment in translation process which a focal actor sought to become indispensable to other actors (Callon 1986 p.208). In so doing, the actor defines the nature of the problems and makes shared identities and interests of other actors, and thus suggesting that certain actors would resolve the problem by negotiations and establishing 'obligatory passage point' (OPP) while defining the problem, proposing solutions and identifying and establishing roles and identities for other actors in the network (p.209). A policy programme is an example of problematisation and OPP. Policies are formulated in the ways to show the interests of the actors lie in accepting the policy framework and therefore invites or even forces actors to take actions for the purpose.
- *Interessement*, works to include and exclude actors in the network which it defines through its problematisation. *Interessment* involves "actions by which an entity attempts to impose and stabilise the identification for other actors (Callon 1986, p.209)." Interessement seems to be often associated with devices. The devices of *interessement* "create a favourable balance of power [...] For all the groups involved, the interessement helps corner the entities to be enrolled. In addition, it attempts to interrupt all potential competing associations and to construct a system of alliances. Social structures comprising both social and natural entities are shaped and consolidated (p.210)."
- *Enrolment*, then, is the moment in translation process wherein the actors in the network accept (or get aligned to) interests defined by the initiator. *Enrolment* describes the "[strategies] negotiations, trials of strength and tricks that accompany the *interessement* and enable them to succeed (Callon 1986 p.212)." Not only is power established in *problematisation*, it also works through *interessement* to develop the network and actor identities. Here, the translation process becomes a 'set for a series of trials of strength' whose outcome will determine the solidity of problematisation and the alliances it implies (p.210). This is what Latour (1987) refers to as the second translation *"I want it, why don't you"* (p.111).

- Last not the least, *mobilisation* occurs as fundamentally the representation of who speaks of what in the name of whom? (Callon 1986, p.214). *Mobilisation* is a set of methods proposed by initiators to stabilise the network. This is a power game, a contested moment of consensus building, where the other actors' space for manoeuvre is at stake (p.215).

Mapping in regeneration programme, in a sense, follows a pattern of translation that constrains actors to take actions in the newly framed way of dealing with poverty as an urban issue. UDRO, as the initiator in the making of regeneration networks, has made indispensable agenda for other actors to relate to the new programme of poverty eradication. Such power has been made through with making policies, financing projects, and hiring consultancies to conduct planning practices under regeneration programme. This is the first moment in Callon's terminology as '*problematisation'*. For Latour (1991) this first step is translating interests to engage actors in the network. I call this major shift the 'the ***purpose of planning****'* in which poverty is translated into an urban matter which is defined within regeneration programmes.

We saw it before how regeneration programme is framed and conceptualised in the ToR, which is an outcome of the policy document prepared by UDRO and approved by the government authorities. In short, UDRO with its power to form a network of actors not just defines the problem but it also creates an OPP in which a newly formed web of actors start to interact with one another and engage with other existing networks in the city. Maps as a crucial device of planning is set as an OPP in regeneration programmes to communicate the purpose of planning (poverty, knowledge, the map and the city) among the actors. Ironically, such purpose is not independent of its national agenda especially for a country like Iran which claims to resist global assemblages of hegemony of power. The regeneration programme is a continuation of a global agenda and the World Bank initiative as a global institution in charge of fostering national policies and programmes with specific aim and goals.

UDRO, after problematising the matter of concern, employs consultants to conduct studies within the framework of regeneration programmes. The ToR of is the main document that determines the process and the expected outcome of the planning step by step. Furthermore, the regeneration policy document encourages local stakeholders to join the network from the city management to the citizens. However, the group in charge of *interessement* in regeneration programmes is the consultants– whom are the **'mapmakers'.** Their job is to establish the problematisation process and make sure all the other actors enrol in the process. A series of meetings with local stakeholders are set and man-

aged in the process. In fact, in each of the five levels in regeneration at least one meeting in the form of regeneration committee should take place.

Yet, *interessement* is not limited to the stakeholders only. Mapmakers, in order to localise the defined problem and enrol other actors in the process, create a knowledge of the city and the status quo of poverty in the city. One crucial phase in regeneration programme as we saw before is identification of target areas. Here the *enrolment* moment starts, in which the mapmakers present their findings to the city committee for further negotiation and making decisions on where the target areas are. Maps are perhaps the most important device for presenting the knowledge of poverty in the city. The ToR as we saw before make the basis of knowledge making in regeneration programme to be gathered in a GIS database, which in turn is made into maps. **Data** as the main component of the database is then the most important element in the *enrolment* process.

Mapmakers wherein enrolling other actors through a set of practices to reach a consensus, make series of maps that become representing tools of their knowledge. The city is framed in knowledge based facts which it transforms the city into maps as a geospatial and visual presentation of the knowledge. This technical process of **mapmaking**, then, is the means for communication that not just presents urban poverty's location in the city but it also mobilises regeneration programme outcome. This is part of the mobilisation moment in translation process. In short, regeneration programme as an interest (*purpose*) is handed over to *mapmakers* (consultants), who gather *data* and information in the framework of GIS database, which then is turned into set of *mapmaking* practices. In the end, the map as the outcome of regeneration programme travels to its *recipients* or the *map users, which becomes a new device in the making of their space and social lives*.

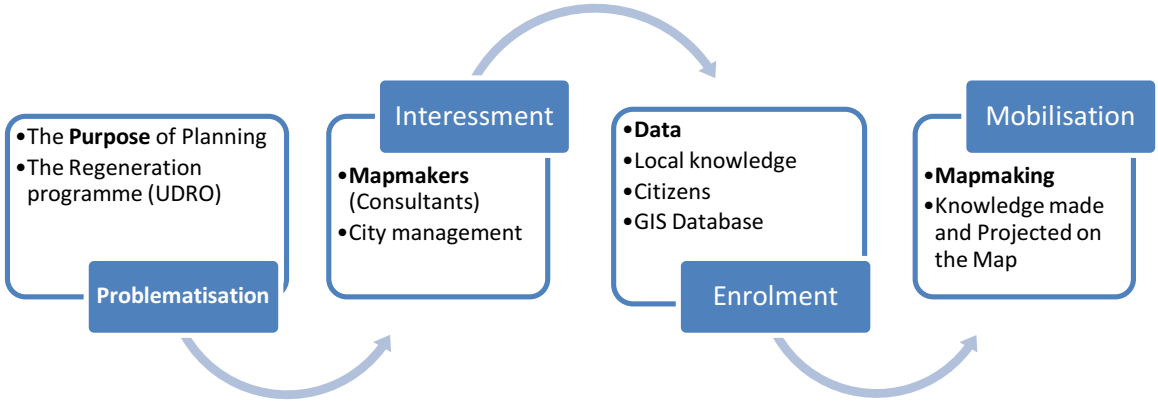


Figure 8: Moments of Translation in Jiroft Regeneration Mapping process

To sum up, as shown in the figure 8, deconstructing mapping in regeneration projects through the lens of ANT and translation process, I formulate each translation moment into mapping moments as: *purpose (problematisation), Mapmakers (interessement), Data (enrolment), mapmaking* (mobilisation). In the following, I elaborate the relation of each one to the other in more detail to explain how mapping produces and reflects urban poverty in regeneration projects in Iran. Figure 9 illustrates the relational inter-connectedness of the mapping moments and the elements associated with each one. Yet, Maps as the final product of translation in regeneration projects reflects the matter of interest and facts into programme of actions. Maps then are representing realities of the place as well as making new realities yet to be made. Maps therefore have effects in the way they are not just presenting but making the place like to anew. The converse of representation is silencing certain voices– power is demonstrated in this way. However, debates around how this nature of representation meant to be differently approached in regeneration project remains an enquiry which I shall get back to it later.

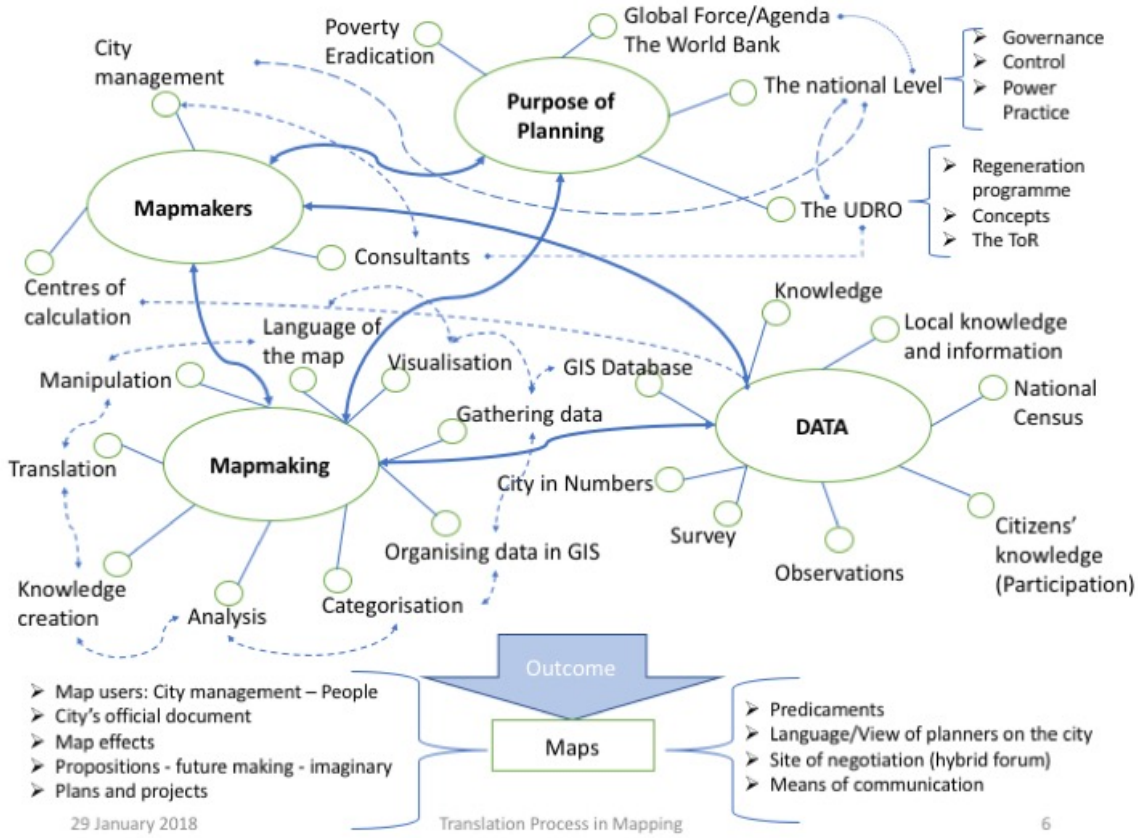


Figure 9: Mapping moments and elements in Jiroft Project

4.3.2 Purpose of planning

Before any mapping takes place a set of goal and objectives are set as the purpose. That is what ANT studies define as the resources for an actor to perform certain roles is prerequisite by the purpose that justifies the action– 'programmes of action' (Akrich 1992; Callon 1986; Latour 1987; 1990). In the case of urban regeneration planning in Iran, the beginning of urban poverty eradication as a national programme is rooted in the initiative by the World Bank in collaboration with the MRUD. The World Bank funded projects not only brought resources to Iran, but it also defined a series of actions and planning programmes with it. In fact, the establishment of the URDO is because of that collaboration. Regardless of questions and critiques that one may pose on this process, as has been subjected to organisational studies as well as postcolonial studies, such a global force with all the resources and agendas that they hold, come to create a network by means of making institutions, training of expertise and producing space and knowledge for new activities. This process has been observed by many scholars (Miller, 2015; Lakoff, 2015; Mitchell, 2002; Harvey, 1989) before. Yet, a little attention has been paid to understanding of how institutions make their own identity and translate global agendas into anew, which is localised within the actor-networks.

Such global forces not only create actor-networks but they also produce new meanings and realities that lead to new insights and programmes of action. Poverty, before UDRO was established as an official office for urban regeneration, was a matter of the poor man and the issues that the public institutions had to deal with one way or another. Subsequently, UDRO assigns consultant companies to deliver the programme and engage other actors. Consultants assignment then is defined in the contract, as a set of agreements and guidelines. The contract and the respective ToR with it is the main source that sets a monitory mechanism for the client as well as a guideline for the consultants to follow a quasi-fixed procedure. The contract sets up a new network for the city and specifically for urban poverty areas. Experts in this process apply different methods and devices, especially mapping, to reach the purpose of regeneration planning as explained above. This group of actors are the mapmakers and planners who hold different expertise all in which comes to produce knowledge and the map as a projection of the knowledge.

4.3.3 Mapmakers

Mapmakers, are a coalition of different actors and actants that produce the map based on the purpose they are assigned into. Mapmakers in the process of urban regeneration planning build their position based on the existing networks. The existing networks that make mapping possible are what ANT scholars call 'centres of calculation' (Latour 1987;

1990); which are locations where mapping agencies (i.e. the Army Geographical Department, the Statistics Centre and the urban planning consultancy companies) accumulate, synthesise and analyse observations. Sadri explained how mapmakers and planners employed existing platforms including basic maps and other sources to produce plans and new maps for cities in Iran. Additionally, Kamal of UDRO pointed to the new role that the ToR defines for the consultants as mediators in regeneration programmes, meaning taking participation and local knowledge more evident in the process of planning. Hence, the group of mapmakers are the consultants, but they are not alone. Another crucial group that have a strong influence on consultants is the city management. The participants in the FGD explained that 'success' or achieving the goals in regeneration programmes heavily relies on establishing a good relationship with the municipality for the consultants [Kamal 3:05]. City management in regeneration process have the power to influence the planning process and change the outcomes accordingly. Consultants as the mapmakers are the main group in charge of collecting data, analysing the predicaments, making a knowledge of urban poverty status and finally relating other actors to their finding. This practice and maps as the production is then an 'obligatory points of passage', which is a site in the network in which governmental departments (i.e. the UDRO, the high-level decision making committee) with their experts control and influence other actors. In the next chapter I show how such agency happens to affect the result and change the decisions even though the findings may suggest something else.

4.3.4 Data and GIS

Data in the process of mapping is an essential actant. The ToR obliges the consultants to set up a GIS database in the first level. Consultants in so doing, employ GIS software (e.g. Esri Arc GIS) then they put all the data collected into the platform. The national census, as the main source of data, transforms the city into numbers which the planners translate it to social and spatial realities and then the knowledge of the place. Inscription devices, as Latour (1987; 1990) describes are technical artefacts such as GIS software, satellite imagery and tables of coordinates, that record and translate nature into visual representation. Maps in a form of knowledge visualisation that enable the sharing of information across networks (Martin 2000). In addition, consultants in Jirfot project approached local citizens and other city management organisations to expand their sources of data and create knowledge of the place which not only comes from national census data but also the local knowledge. Such approach was mentioned as the unique character of regeneration by Kamal and the consultants involved in Jiroft project.

However, there are few problems in place in the case of Jiroft project. First, the Statistics Centre of Iran has its own map of collecting data based on urban blocks that usually does not match with the base maps which the city management uses. Each urban block is a boundary that starts from a corner point on the main street and runs around the block till the point it meets the start again. Obviously, not all the blocks are equal in size nor they form the boundary of a neighbourhood. Therefore, the comparison logic of identifying and prioritising urban poor areas should ignore the difference in size and take it all as equal units. In fact, this is an arbitrary character of data that is fixed in time and the way it is constructed. Though, the national census is not the only source of data.

Sadri in a sarcastic way defined the character of data in Iran as something that is only found as a hidden treasure which is not in one place but several spots. Ironically, each source rejects the validity of the previous source of data and this can go on for ever. The ambiguity as well as the arbitrary character of data in this case leaves many debates open for further investigation, yet, reliability of the process is also a matter of concern. Meaning, the analysis of data in identifying poverty in regeneration planning must be reliable in a way in which if other experts did the same process the result would be the same.

The vast part of what it takes to go into making a map is not readily visible in the images that are printed as maps. The participants from the consultancy pointed to this several times by saying the GIS database and various layers made and put into the map is not reflected. Such enquiry has recently been under focus in both STS and critical GIS (Bier 2017) which emphasise the ways in which "cartography is an extended process, from the initial collecting of data, to choices of how data are categorise and displayed, and on through the map's ultimate dissemination and use (p.64)." In this respect, I briefly mention how GIS works in projects like Jiroft regeneration programme to clarify a little the process of making map. Yet, the data is the key component of map.

GIS software is fundamentally a platform for visualising and analysing multiple datasets at once. Esri's ArcGIS Desktop is the main software used in Jiroft and most of urban planning projects in Iran. The software arguably has many different options to visualise and analyse geospatial datasets. Hence, its primary source mapmaking is statistics and quantification. The first thing that comes up on the screen when a new project is defined in ArcGIS is similar to a blank Word document. A new GIS map document is often a white window on the screen, then one after another different layers for roads, urban blocks, urban facilities, infrastructure, rivers, mountains, topography and so on and so forth are added on to the document. They are then modified and selected to make the final view of the map. On top of that the kinds of layers that are added into the map are

data sets that can be linked to tables with a large number of related attributes mainly from national census and other statistics. The mapmakers then use different formulas to transform the existing data into concepts such as density, population pyramid and urban fabric labels. The result is then the map becomes fluid and provides various outcomes for projecting the situation in the city. Additionally, the software also accepts extra design options for planners to make changes by hands in the way the map is made and viewed. Qualitative inputs are usually added by hands and based on the findings from observations and local knowledge.

In the end the result is the printed map or the digital file that can be sent off everywhere. Valérie November, Eduardo Camchao-Hübnrt and Latour (2010, p.584 as cited in Beir 2017, p.65) point out that digital cartography has "*rematerialised* the whole chain of production"– a chain that "requires people, skills, energy, software, and institutions" that all contribute to the "constantly changing quality of the data." (Bier 2017). GIS technology has a tremendous new possibility for mapmaking by the options it provides for mapmakers to change and update the database. Producing maps and adding new data on the process of mapmaking is so much easier and less costly so it constantly can change and update the map. Once the map is printed it is more difficult to change and add things, as it was before with the maps, whereas, with ArcGIS the printed map has less value and it is always a matter of negotiation for changing and finalising it. So such rematerialisaiton has a direct effect in the way the map is communicated and produced. In the next section I elaborate more on mapmaking as a process in planning as another crucial moment of mapping in regeneration programme.

4.3.5 Mapmaking in planning

A first step in theorising mapmaking in planning demands defining what is planning. Planning has generic meanings from the object of planning to the subject of planning. Though, planning as a subject involves the scope and the purpose transcending the matter of concern to a new becoming. In regeneration programmes, such transcendence is framed as poverty eradication and community empowerment. Though planning in broad sense, refers to linking knowledge to action based on rational choices and subsequent decisions. Hence, planning focuses on future to be controlled, imagined and guided; all these framings, though, fall into over abstraction (Alexander 2016). Regeneration is no difference in overall logic.

To overcome such abstraction, it is helpful to reframe the focus from the understanding of what the planning is to how planning is practised. In this light Alexander (2016) states

"planning is what planners do" (p. 91). Such shift, then, opens even a broader realm of what is a practice? The answer is, well, there is no single practice, but significant different ways of practising planning co-constructed in a matrix of planning purposes, content, socio-economic, politics, culture of planning, money and power. Planning in this sense, thus, includes: 'a nexus of knowledge-centred practices to generate actions each identifiable by its domain of subject of concern– its "epistemic object" (Knorr-Cetina 2001, as cited in Alexander 2015, p.94). As such, regeneration planning also refers to specific set of practices which aims certain goals and purposes. I had shown what regeneration planning refers to, at least in theory as documented on the ToR. Hence, I move on to mapmaking as a crucial practice of planning in the content of regeneration planning in Jiroft city to show how mapmaking is practised.

Sadri over and over during the FGD emphasised the relation of the function of the map in planning and the ways maps are made. He explained what a map is in the FGD based on the example that was on the table (Figure 14), saying:

> "The map is a tool for showing the status quo of the city. Maps are always a reflection of concepts in space. Meaning it is the language of space expression, yet, concepts appear to be presented on space through maps. For instance, we label specific areas such as 'informal settlements' or 'the central town' or 'here the rich people live' and so on, which is converting [transforming] the concepts into space representation. Then, we [the planners] make predictions and suggestions for it. Therefore, the map is a tool for expressing our [planners'] view of the space; and the interventions we want to apply into it. As a result, based on what portion of the space is subjected to encounter and our planning scale, the language of the map changes. Meaning when we want to express an overall concept of the city, we have certain ways of expressing it on the map, whereas, when the subject is focusing on some detailed matters, then, the map changes. That is to say: the early sketches of what the city or a neighbourhood is like; we label the map as spatial organisation map of the city or a neighbourhood." [Sadri 01:55:20 – 01:57:40]

His statement, summarises how maps are made and why. From this standpoint then any practice of mapmaking involves understanding of the entanglement of concepts and the purpose of mapping as a visualisation of the view of the mapmaker in a spatial and geographical scale.

Mapmaking in regeneration planning, in a nutshell, is a way of enacting poverty visually based on the knowledge that planners create. Practice of mapping in a very simplistic narration involves: collection of data and information (quantitative and qualitative),

which translate the city into data and numbers; then the data is categorised, calculated, analysed, defined into new meanings and categories; all that makes the knowledge of the city. Accordingly, the map is projection of data on the city's map. In other word, visualisation of the knowledge on geographical location of the city as detailed as urban blocks.

4.3.6 Maps as official documents

The map as an object in the process of regeneration is in the end an official document, which is an interesting site of research. Latour (1990) based on his empirical work explored the everyday practices of scientists and establishes the critical role that inscriptions play in the formation of scientific knowledge. Devices, such as mapping, facilitate thinking and communication which in the end fixes ideas of that specific knowledge. He develops and exemplifies nine key characteristics of 'paperwork' that allow interests to emerge around shared inscriptions: mobile, immutable, flat, modifiable in scale, reproducible, capable of being recombined and layered, but also optically consistent and amenable to insertion into other texts. Mapping, in a sense, hold all the characteristics that Latour mentions as process of fixing ideas through paperwork.

The consultants in the FGD defined the map as a language that presents their view of the city which shows how they envision as well as plan for the city. The purpose of the map, as such, is inherently to document the situation at the time and then to make plans regarding the city organisation and management. The map also has its own language and tells specific stories and narration of what it is out there in the world. Being able to read its language is a skill that planners are proud of. Nonetheless, the map is, in the end, a document and a site of controversy that gets to be officially recognised by the authorities. The map as a language and a text, presents the view of the city in the present and view of the city yet to become. Map not only links the view of the city as how it is but it also connects present to an imagined future.

The map, hence, as the final product of mapmaking and a crucial outcome of planning becomes a referential document for actions only after approval from the respective committee. In other word, the map becomes an obligatory point of passage for all the other actors including the local citizens to connect to it for city management. However, the map is also a document that travels to different desks and under different hands, which then turns to different meanings. The map, thus, does not necessary communicate its message to the reader, but, creates new sets of relations among those who connect with it.

Once again, this character of the map was referred to in the FGD as language of the map. Language of the map, as a metaphor, explains what the map is saying. This language is not invented but it is standardised by the institutions that legitimise its effects. The map tells different things through the language it uses which is based on the purpose of the map and how it is made. Yet, the main hidden element in Jiroft maps are the process of knowledge making, which is partly written in reports and mainly black boxed for the non-experts. In the next chapter I will show how the language of Jiroft maps fails to show how it is made.

The map, as a bureaucratic document is a site of negotiation in which it produces realities of the place. Here, controversies and competing visions and opinions start within the network for superiority and establishment of specific agenda, which Latour (1987) names it as '*trial of strength*'. Jiroft is no exception. The outcome of the urban regeneration planning goes through the decision-making committee that approves maps and reports as a guiding document principle for the city management regarding regeneration programmes. From this point on, the maps are delivered to the *recipients* which becomes a reference for future making. The map, therefore, creates new assemblages in which new actor-networks are mobilised.

Hull (2012) in his detailed ethnographic study of materiality of bureaucracy and state control in Islamabad, Pakistan, shows that the "graphic artefacts" of bureaucratic practice such as maps, files, lists, and surveys central to modern governance are not only extensions of government or techniques of rule but are also jointly produced with the people and the landscapes they purportedly control. His observations are from both the official development institution of the city and the local communities in which both parties deal with paperwork and maps. He states that researchers in studying of bureaucratic texts should pay attention to "how documents engage (or do not engage) with people, places, and things to make (other) bureaucratic objects". He specifically points to the relation of maps and the city and says: "A planning map is not only an ideological projection of a bureaucratic vision of the city; this vision is embedded in the technical and procedural processes that link a map to road, structures, streams, and documents." (Hull 2012, p.5). In this light, he identifies bureaucratic ideology of mapping and the relation the map makes with material components of the city. The map therefore, as much as is projection of materiality of the city, it is projection of the view of the city from specific group of actors. His study, though, goes beyond the realm of this research, yet his findings may be well applicable in the case of Jiroft. In the next chapter I explicitly focus of the maps in Jiroft regeneration project to find out the visual expression of maps and mapping in Jiroft regeneration programme.

Chapter 5 Map projections in Jiroft re-generation programme

> "... a geological map ... is a document presented in a visual language; and like any ordinary verbal language this embodies a complex set of tacit rules and conventions that have to be learned by practice ... [therefore there also has to be] a social community which tacitly accepts these rules and shares an understanding of these conventions."
>
> Martin Rudwick, 'The emergence of a visual language for geological science, 1760-1840', 1976, p.151. as cited in Turnbull, D. 1989, p.5)

In the previous chapter I showed how maps are made in Jiroft regeneration programme. I discussed the purpose of making maps in regeneration context and analysed the most important elements in mapping in Jiroft project. Here, I focus exclusively on the maps after they are made. I seek therefore to find out what maps show and don't in based on Jiroft's regeneration maps. However, before getting into the flow of debates, I find it helpful to describe the space in Sharestan consultancy studio, where the maps are made in first place for the reader. The description of how the studio's environment looks like provides an understanding of how the studio as space of knowledge making performs in relation to how experts practice urban planning and mapmaking far from the actual place. The performativity of the planning based in Tehran, presents the enactment of their method in imagining the situation of Jiroft City through devices and boundary objects they employ in their practice. The distance is then bridged by the kind of network they make to collect data and information about the situation in the target areas. The knowledge in the making then is enacted within the distance of the reality in studio and the reality of the place. Albeit, the enactment of knowledge creation, the space is also an interesting enquiry for research. Such enquiry may seek to find out how reality is enacted through mapmaking, and how urban poverty as a reality of the city in reflected and pro-

duced through maps. In the following section, though, I bring the reader into the urban studio space where the FGD was also conducted.

5.1 The urban planning studio and the making of the city

Entering the office, in a residential style apartment, the secretary's desk stands in the middle of a corridor that has two directions. One leads to two rooms with closed doors where the managing board sit; and the other leads to a big living room called the urban studio. The urban studio is a space with eight desks facing walls around the room and a big meeting table in the middle with a lot of maps and reports on it. Each workstation is occupied with one employee who has a wall to personalise his or her space. Most of the walls are covered with maps and plans of various projects. The people there are usually talking to one another and many others go in and out from other section of the company, whether it be the architectural studio or the IT or the project control and finance. The whole company has different floors, which I only focus on the urban planning section. The space is quite open and no one can hide what's on the screen but when they are at work they are all back to back and drained in their own space.

People in the studio are all graduates of urban planning, architecture and urban design. During the day, they use different computer software based on the mission they are assigned to. The project manager is mainly in charge of dividing tasks between the team members and coordinating different needs and requirements of the project with governmental authorities as well as the respective local agencies. Though, the team is not limited to people in the studio but it includes outsourced experts such as an urban sociologist, a demographist, an economist, a traffic and road specialist and an environmentalist. There is at least one local coordinator for each project, which is in charge of coordinating and collecting information in the local level.

The image below shows the urban studio environment during the FGD. The maps on the table are the examples of maps in Jiroft project which were subjected to discussion during the FGD. I will return to those debates later in this chapter.

Figure 10: Focus Group Discussion in Sharestan Consultancy studio, Tehran, March 2016

5.1.1 How the city is imagined?

The other side of the corridor, though, is where the team and the project gets directed. In fact, the view of the city and the nature of the work is guided by the project director, Sadri the CEO, who is a well-known architect and urban planner in Iran. The overall perspective of the work and the focus of the project and the approach is to a great extend influenced by his view. Employees in the office follow the guideline and prepare the work for the project director's approval. Therefore, to understand the nature of the work one must start analysing the agency of the director and get to know the view of city and urban planning in general through that lens.

Sadri in explaining his observations of the genesis of modern urban planning in Iran, points to series of fundamental mistakes and misinterpretation of the idea behind urban development model since the establishment of municipalities affairs in the Interior Ministry back in the 60's. The model frames the relation of the central government with the local municipalities as well as the relation of the municipality with citizens and the services they should receive. Nevertheless, he defines the city as a "living entity" that is actively growing and changing (Sadri 2015, p.40). He uses the phrase "philosophy of life" many times in the statement of what is the city and how should it be treated. Furthermore, he states that cities most of the time reject what planners imagined ideas and plans for the future. Albeit, he repeatedly emphasises that the role of planner is to moderate this process of ever change cities and try to come up with innovative solutions to city's

major problems. He uses the metaphor 'city doctors', meaning doctors who their patients are cities, to explain what planners are and do for the city (p.121 my translation).

His proposition of what is planning also reflects this view of the city as living entities. He emphasises that planning must be a continual process in which planning is actively involved with the changes taking place in the city. This active agency for him has different levels from national scale to local as well as in a neighbourhood. In his opinion planning should never stop as neither does the city. In the end, he acknowledges that throughout over fifty plus years of his career, he could never reach and establish this view in Iran for various reasons which he does not mention explicitly (p.203 my translation). In the debates about how what does planning mean in regeneration projects in the FGD, he said:

> "[…] Then planning in this respect is rather urban design and not planning in broad sense. In Iran, we are only capable of designing or thinking of design for specific purposes in specific places. That is why I use the term scheming rather than planning in our practices." [Sadri 01:58:00]

Assuming this view is the core value of the consultancy to approach planning and conducting research about the city, we go back to the studio to find out how the process of planning works in practice by referring to the environment and the nature of the work at the studio in the context of regeneration planning.

5.2 What do maps show and don't?

In the second part of the FGD, we looked at a series of maps as listed in the ToR for Jiroft project. Discussions were based on: how does the role of map in Jiroft regeneration project differ comparing master planning maps for example? What does get to be represented and what doesn't? And how data and information get to be presented in the map? In the beginning, Sadri raised an ontological question saying: what maps show and how they function is related to how we as human understand the world around us. He referenced a book titled in Persian as "*One, Two, Three and the infinite*", saying humankind's ability of thinking is framed in a dual logic. Meaning human mind always compares two entities with one another and then the third entity comes in comparison to the other two. One by one comparison then is the same logic applied into computer science in a form of zero one logic or the binary code. In this view, planning as a way of thinking about the world and cities also follows the one by one comparison logic. Mapping then is the process in which the comparison happens. GIS software analysis also applies comparison in such a vast scale.

He furthermore, draw a connection between the ways in which we make an understanding of the world which is reflected in how we plan and make maps. He pointed to some of the maps in Jiroft project saying:

> "... [in urban planning and mapping for cities] reduces the reality to the extend in which we come to understand it and then expanding it to the overall situation during the study. For example, when we want to categorise the city based on land use on the map, we only come to a few categories to represent the land use map and therefore to recognize the city's dominant functionality in relation to the other functions and characteristics." [Sadri 01:53:30]

He among other participants explicitly mentioned the view of the planning and the purpose of it in relation to the scale of the map and the logic it follows. All these elements were referred to as the language of the map. In section 4.1.2 I described the logic and the language of the map. There I discussed how participants used language of the map as a key feature in understanding the map. Therefore, the language of the map is a key to understanding what maps say and don't. The map of the spatial organisation of Jiroft City (figure 11), as an example, shows the main streets, entrances of the city and the central part of the city and so on. In this scale, the map only shows the general features and elements of the city.

The language of the map and the concept behind it which is partly the title of the map says that the spatial organisation of the city is made based on the boundaries of the city and the main roads and entrances to the city. Boundaries include the river and the canal in the city and the ring road (doted arrow in dark blue). Moreover, the main entrances from that are the big red arrows which lead directions in and out of the city. Then the main streets in the city are presented in doted red and cream colour arrows. Other information in the map present the traffic conjunctions in red circles and the main areas of activities such as residential zone in mild yellow, commercial zone in red area, and industrial zone as in light blue area.

The map, therefore, only shows general character of the city with limited information collected from the existing maps and city traffic data. However, the concept behind the map tells an interesting story of what is the main elements of the city organisation. The city in this map has three main zones: residential, commercial and industrial. So to speak, the nature dictates some of the boundaries of city development, but the vein of the city is its street, which also refers to the metaphor used by Sadri in describing cities as living entities.

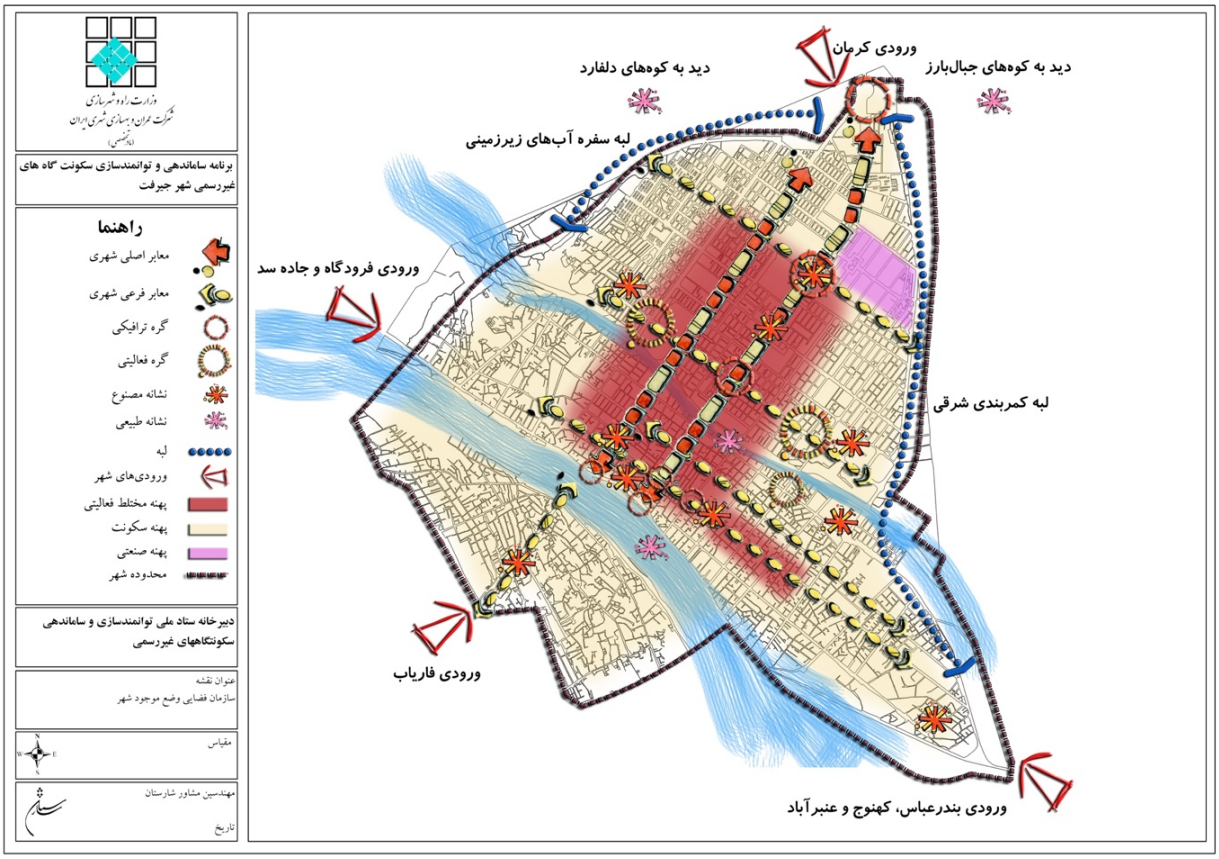


Figure 11: The current spatial organisation of Jiroft City

This map, nonetheless, is showing the whole mechanism of planning and spatial organization of the city. The map is the tool to present what planners undermine as what is the space organisation of the city and how it looks in Jiroft City. This is obviously limited to certain points and facts and all the components cannot be presented at once. The logic behind it, as Sadri pointed, is comparison of one element to another. In this map which is city wide scale we only see the main factors such as main streets, some crucial spots, centres, and so on. Thereafter, the outcome of this map is the analysis that consists of how and why some of these elements should be emphasised, some reorganised, and why these spots are important. The next step is then making plans and designing for them. This map, thus, is simplification of the space in city scale into most important components of the city. Maps once again is the tool for expressing the space and the view of the planner on it.

Furthermore, approaches in making the map and the way in which planners gather data and information influences the language of the map and the concepts it seeks to present. Basically, when the scale changes the language of the map changes and vice versa. Yet, there is no unified language of making maps. The unique character of the regeneration planning in comparison to classic urban planning methods as lays on the fact that in re-

generation planning there is a strong orientation on public participation and stakeholders' engagement which makes regeneration planning different than other planning practices. In the next section I explain how participatory approach is mainly limited to the way in which data is gathered especially in the mapmaking.

5.2.1 The absence of process of mapmaking on the map

In the FGD we tried to see how the map language and the process is shown on the map. Kamal, following the debate on the city's spatial organisation map, added how this map among others differ from master planning maps. He pointed to the scale of mapping and the source of information that in regeneration projects consultants get closer to the actual event in the place and collect detail information of the properties and conduct surveys to gather people's opinion.

> "… property ownership and the public needs are two important elements which master planning don't pay attention to it, whereas, in this kind of planning the consultants go and ask people what are their needs and what they want to see being built. Hence, the plan is close to public's needs and opinion. […] My point is that the processes and approaches in this kind of planning is reflected on the maps." [Kamal 02:05:10]

The below map for instance is the map of Jiroft City boundaries from the masterplan. This map only shows the view of the city from aerial images as well as a line that indicates the boundary of the city. Then there are two yellow highlighted areas which are two small villages next to the city with a considerable population. Consultants explained that: "those villages are left out of the city limits, but they almost have all the characteristics of other neighbourhoods in Jiroft City. Though, the villages are important because local authorities had shown them while the team was visiting Jiroft [Pedram, GIS technician at Sharestan]." Here, this is a knowledge that is extracted from the local sources and then used in the map to show the importance of those areas.

However, this process is not in any regard reflected in the map, unless one knows how it was conducted. Meaning, the process of making knowledge and gathering data is not in any sense projected on the map. The nature of Jiroft project applies participatory approaches which it creates more fluid planning that allows more engagement in defining the predicaments based on local knowledge. Yet, the outcomes of Jiroft project is an example of regeneration for informal settlements is not always the same as other projects. Albite, the maps may look the same.

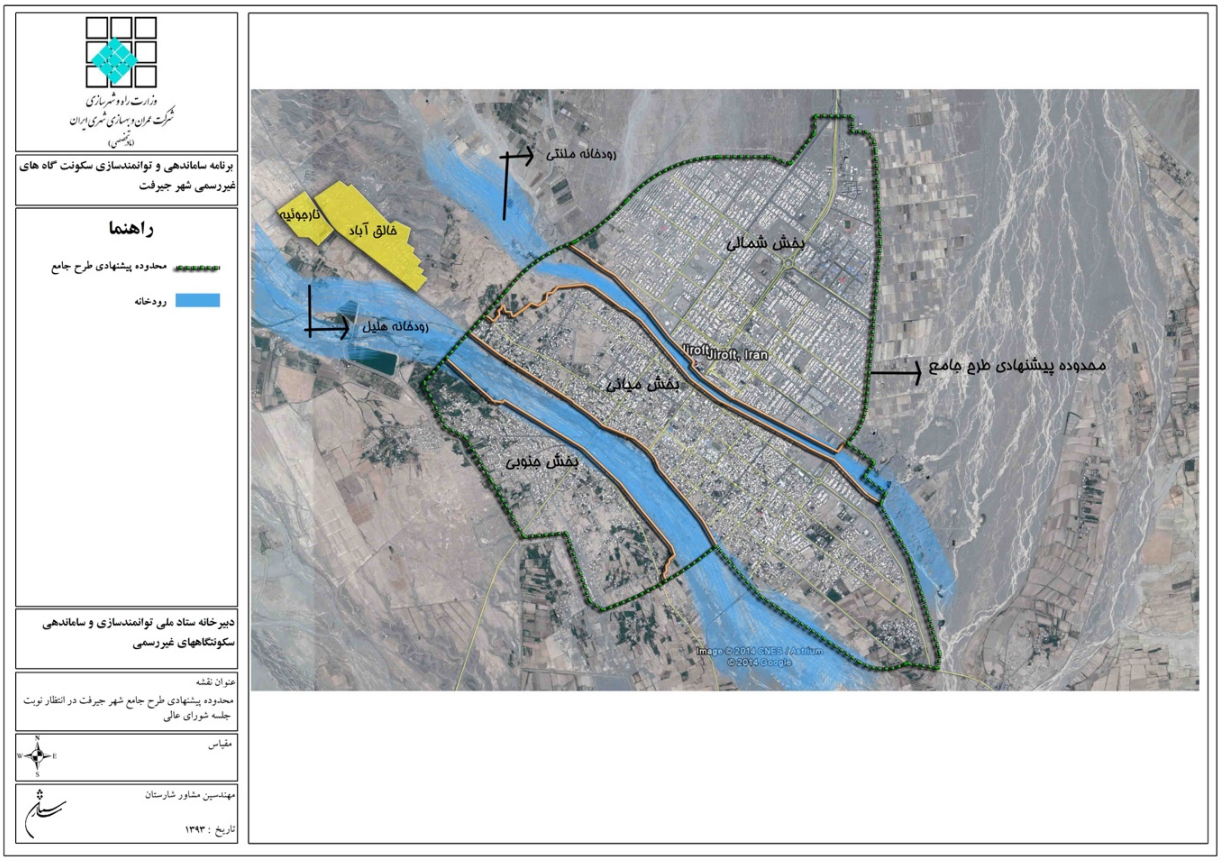


Figure 12: Jiroft City boundary in the masterplan (2014)

Kamal smiled looking at the map saying that the colour blue in this map which shows the existing of rivers in Jiroft which are completely dry. This came to be criticized by local officials questioning how consultants made the empty river filled with so much water! This may sound stupid but it points to the different perceptions that the map communicates. The question here, as Kaveh mentioned, is: “what was behind the mind of the expert who produced this map? Why is it in here?” Consultants and Kamal rapidly responded to this critique saying: “this is in fact a way to preserve the limit of the river and not let anyone to build in this area, whereas, those who criticize this want the opposite, so they use it as a way to question and delegitimise the planning.” This is quite interesting controversy that the map gets to be in the centre of conflicting interests between knowledge, nature and representation. The knowledge on the map does not reflect nature here, but, it uses a social political intension to stop or prevent an event in favour of the city environment. In practice, it is a way of knowing and handling the world. Maps as knowledge, though, is taken to be true. Yet, when an obvious false appears, then the controversy comes to change its role and the actual effect.

5.2.2 Mapping and the making of urban poverty in Jiroft

Another series of maps that we looked at in the FGD was the identification of target areas or the urban poverty status in the city. As mentioned before the initial phase of regeneration planning is to identify target areas based on a set of criterias for poverty index. Maps in figure 13 show only three general categories including: socio-economic (top left), demographic (top right), spatial dimension (bottom left) and the overall poverty index (bottom right). These maps show the findings of the study (outcome of the first level) but do not mention the process and how this was reached. Sadri again replied saying that: the process is described in the report that comes with this, yet, this is simplified version of the concepts that we applied in defining poverty index and showing it on the map. Sadri added: "…this view has to be reviewed repeatedly and each time new aspects and new understanding should be added into it as well as correcting the findings of the research. This is the biggest mistake planners make by simplifying the reality into fixed notions in specific time to present it on the map. That is why I say planning should be a continuing process and not frozen at the time of the research. Planning must be process based and not result based" [Sadri 02:24:30]

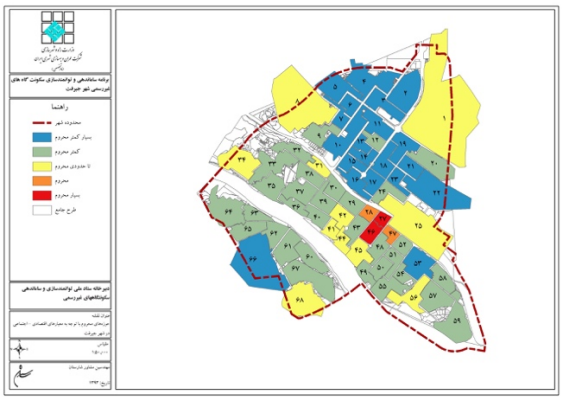
Looking at the maps each numbered block is equivalent of one census block. As mentioned before the size of the blocks are not equal in area per square nor in the number of people who live in there. Hence, the nature of the data and the way it is collected dictates the unification of the city. However, focusing on the map to find out how it represents distribution of poverty in the city, one sees different colours for each block. Ironically, the colours do not follow the same pattern and have different range in each map. But in general red is the lowest rate of quality of life according to how the index is defined and blue is the highest rate. Yellow is also the average rate.

Here, let's see what each of the map say in comparison to one another and in combination of all the indexes in the final map. First, the poverty index is, as mentioned in the ToR, semi-fixed concepts that analysis the national census data in each block and categorises it based on its rate above and lower that the city average. Ironically, there is no single block that shares the same rate of lowest quality of life in any of the maps. Second, for demographic and spatial criteria there is four rates (excluding the white one which is non-existing data) and then socio-economic data has five ranges. The reason for this, one of the consultant mentioned, was that experts in charge of preparing then had different view of how to rate the criteria and therefore they are different. It seemed the actual reason even for the consultants was in a black box that each expert uses to come up with such findings. Finally, the map that combines all the criteria together and represents the

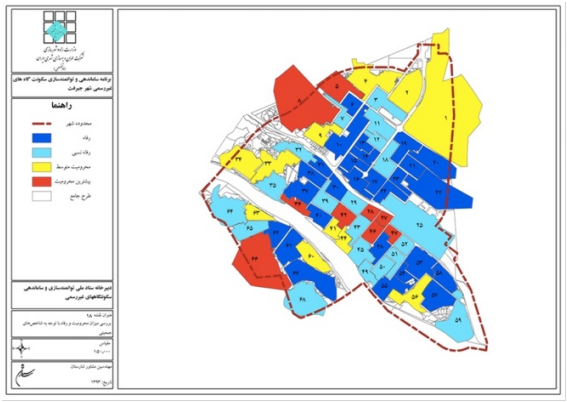
distribution of poverty in Jiroft City shows a very different result that each of the criteria. Take the biggest block (number 1 in Persian: top right block on the maps) as an example; this block is on average status as socio-economic and demographic criteria and as highest rate for spatial criteria. Then, all the sudden, that block becomes the lowest rate of quality of life in Jiroft as all the criteria is put together. The question here is how this happened?

In respond to this question consultants explained how there are other factors that is not necessarily found in national census but from internal sources and when they make the final map they somehow apply those criteria in the map by manipulating the rates and the given value each has. Meaning not all the criteria are equally valued in each context but they are different in the way in which they present the status of poverty in the city. Consultants have a hand in changing the way the data is presented and analysed in the study as they find reasons to do so. This in the one hand brings doubts in terms of objectivity of the analysis and the agency of consultants in making of poverty. On the other hand, it adds into the fluid character of the planning as a practice which not only relies on data but also seeks for qualitative information and observations.

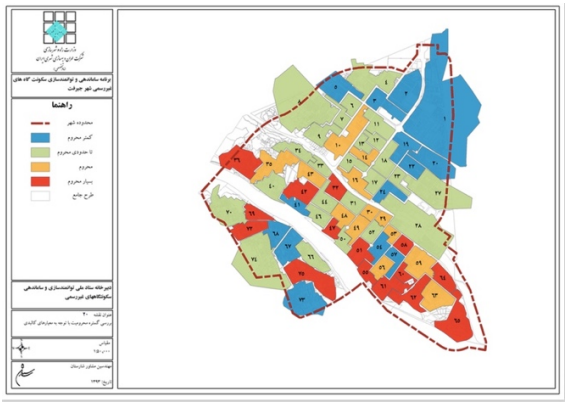
Such agency is not only limited to the consultants but it has also been given to the city management committee as the final decision making forum. The committee has the power to negotiate the findings and add the view of its members into the final decision, which are from different sector of the city management. At the end of the day, they decide about where are the priority areas for regeneration planning. The map of approved target areas (Figure 14) is their final decision which does not even match with the final findings of the status of poverty in Jiroft. Basically, the municipality as the recipient of the study and the main stakeholder has a strong view on what part of the city should be targeted for regeneration planning therefore a crucial actor in making the decision. Once again this is a competing view of experts in a hybrid forum, which in the end makes the urban poverty. Maps in this process come to present a set of realities that are not clear how is been made in relation to urban poverty assemblages. Maps, however, come to reflect as well as to produce poverty and the reality they claim to represent. Not only this, but, it is also flown among different actors in the network who finally come to fix the notion as a new reality of the city. The target areas after this map is produced become new places at least from the authorities point of view. The new places then carry new titles and a new identity for city management. Planners in action make urban poverty.



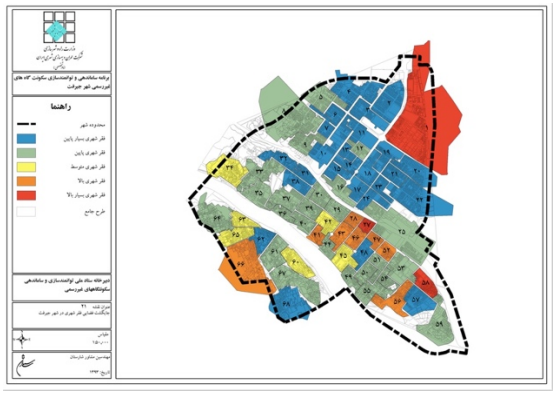
(a) Socio-economic criteria



(b) Demographic criteria



(c) Spatial criteria



(d) Status of poverty distribution in Jiroft City

Figure 13: maps of poverty index in Jiroft City

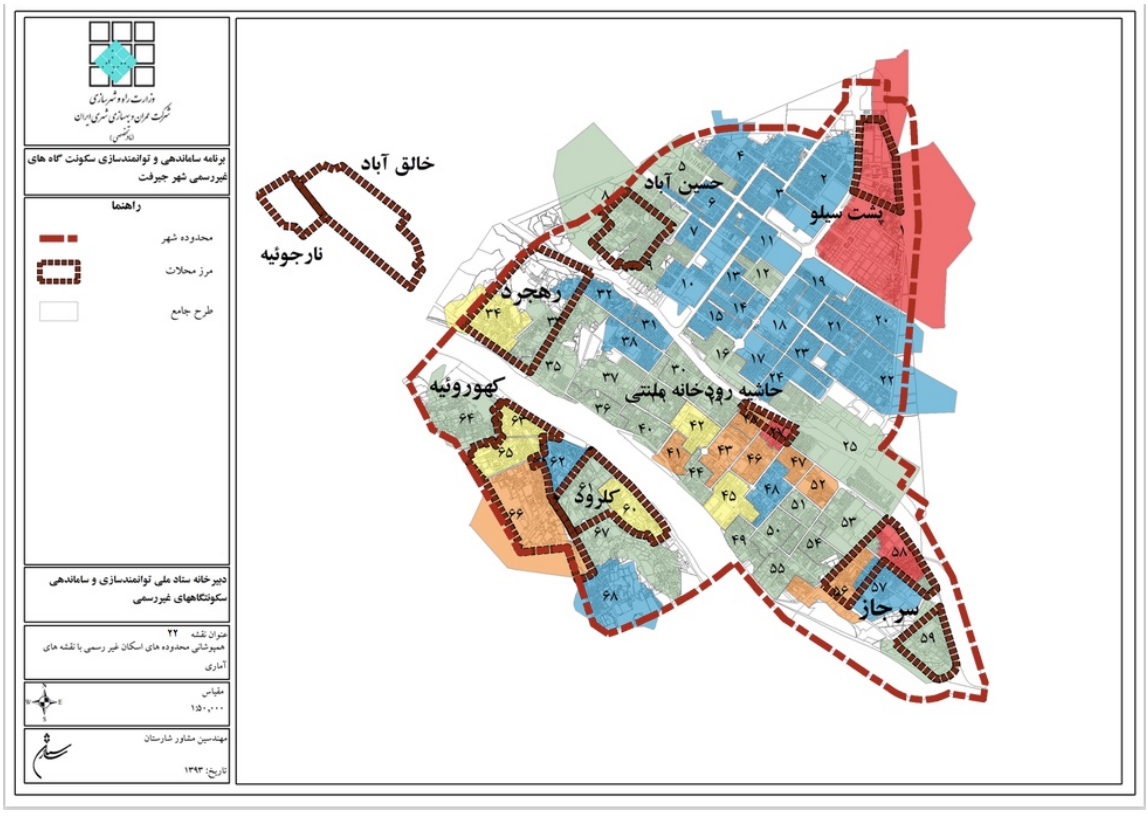


Figure 14: The map of approved target areas for regeneration planning in Jiroft

Although, the process has fluidity in practice, there is arbitrary characters in the way in which the map is made. The arbitrary elements as Payam, the sociologist and urban economist, mentioned include: "...the boundaries in this map and the way it has been produced has its own arbitrary character; that is the blocks project which is different size and based on the national statistical data. I think the time can be projected into it by technics of showing the process and the timeline into the map [Payam 02:25]." He raised interesting points on how the concepts used in making this map based on poverty location and the extend of it in the map, which is mainly based on quantitative data and not really objectivity; meaning it is a reliable process which if everyone else take it, would come up with same results. Therefore, it is presenting a reality of the city and its places on the map.

Reliability at the end of the day shapes the function of the map as a unifying mechanism. The map in regeneration programmes functions (and perhaps in general sense) to represent or better to say present space in two different time scale– the present and the future. The map either shows, as accurate as it gets, what is in the reality of the place; or draws a desired future for the place designed by the experts based on the knowledge they produce about the city. Clearly, (re)presentation is limited to selection that should be made in mapping.

5.2.3 Map effects: unification and representation

Above maps as examples provoked a debate in the group on whether does the map have a new function or a new role based on what we see? Payam raised this point and mentioned that: "One function of map, which is very important, is that maps work as a unifying mechanism. Here the question is what does the map represent and in the representation what gets represented and what gets hidden? Obviously, map is there to make things visible to those who it targets, yet the map is selective in representation and that is the role of agents or actors that make the map to select." [Payam 01:24:10] His point also refers to the agency of planners in selecting and representing the knowledge that the map claims to present. Albeit, public participation and information had a stronger role in the making of the map compare to masterplan for instance.

Hence, Payam drew attention to another aspect of unifying function of the map and the ways in which map changes the understanding of the city as a tool or a medium. His objection targeted the consultants (as well as the UDRO expert) which do not acknowledge the agency of mapping in relation to representation, knowledge and power. Indeed, he make an interesting point in showing how the entanglement of knowledge-power and the

agency of those who make it and claim it on the map changes the way in which we understand the city. The statement below shows how he referred to map as a unifying device:

> "The city as a unified concept is the result of seeing it as a unity and not just a place and a neighbourhood as it was explained before, so mapping of the city and the map came to function also as a unifying mechanism. The map as a representative of realities pass through the agent of map makers and technicians who make it with the language they know but in a way that it would have macrocosmic understanding. At this stand, maps translate a selected set of elements and realities into a form of understanding that everyone would associate with it in different ways. That changes the understanding of the city and the view of it accordingly." [Payam 01:25:40 – 01:27:00]

To find out unification and representation as major effects of maps, we looked at some other maps that represent the target areas and present the situation of each on the map. The example below is one of the target areas. The map shows the boundary of the neighbourhood and the land use of each parcel in that area. Different colours on the map have different land use codes; for instance, yellows are residential houses and blue represents educational centres such as schools. Additionally, the consultants had put the locally known names of the streets as well as few pictures that are taken from the area as projection of how it looks based on the field visits they conducted. One effect of the map in this example is that, it suggests that the neighbourhood is home to impoverished households, or in other word the poor area. It also labels the area as informal settlements, which unifies the whole neighbourhood as an informal sector. The questions here is: are all of the residents informal here? What does it say about the social life of people living there? The map, then, is unifying the neighbourhood as an informal settlement in the way it represents the place, which is a selective process of making a concept being projected geographically on the map.

Figure 15: The land use map of Kale-h Rud

Kamal responded to some of the comments on the above map trying to emphasise on the role of maps as a tool for resolving issues and the strength of regeneration planning as it applies participatory approaches. In the below statement, he tries to point to some the features of regeneration planning.

> "I think we should see map just as a tool for representing realities on the ground. Nowadays maps come in play as tools for conflict resolution of benefits which planning plays a role. Here, map either get influence by the approaches of planning and influences the production of space. […] In Jiroft case the consultant had gone to the place and gathered the information based on people's view and understanding. Then they have produced these maps which has an important role in redefining the realities of the places that the map targets." [Kamal 01:31:50].

Accordingly, Payam responded by interrupting Kamal saying:

> "I understand is that you are saying the map either represents the reality of now and draws a desirable future. Regardless of to what extend it will come to reality and those plans will be implemented, but, in representation two sides existed: one is the present and the other one is the future. In this act representation always come with selection process which deliberately or not puts few things aside and emphasises on few others. That is a power practice." [Payam 01:33]

In the end, Kamal as an employee of the state acknowledged the power relation in making of maps but he insisted on the participatory character of regeneration projects. His emphasis on participatory approaches to some extend meant that regeneration programmes does change the power dynamic of planning. Such claim, however, was not evident in the ways in which maps are made in Jiroft project, nor in the final outcome of the planning. In the next section I emphasis on the participatory aspect of mapping in Jiroft regeneration.

5.2.4 Local participation and the hidden aspects

Debates, discussions and questions around the maps continued in different respects. Some final conclusions that summed up the discussions were: these maps do take into consideration the local communities into the process of collecting information, but this is far from high level of participation. Several reasons came to be acknowledged on the existing capacity of planning processes in Iran and the boundaries it faces. Moreover, the role of technology and experts in surpassing and making the boundaries at the same time was acknowledged among the group. The controversies made a space for interesting identity roleplay and institutional representation; mainly in one side the governmental actor and the consultants, and the NGO and the academics in the other. The hybridity and the dynamic of the group discussion floated based on the question and the topic.

However, one of the main actors that was missing in the discussions was the local authorities and municipal experts. As a result, the ways in which the local authorities receive the map and use it, has a very different set of realities and issues. Discussions pointed several times to how the map is used and how the study never gets to be implemented, but no municipal representative was there to share his/her view on the matter.

Though, I discussed in previous sections that participatory approaches are mainly limited in the way in which data is gathered, at least in the making of maps. Hence, Mehrnaz, as the only woman in the group brought a very different view on the use of maps for planners in relation to local communities. Her insights were mainly concerned with her experiences of using mapping techniques with children and local communities in participatory urban design processes. She specifically raised the view of the map as fundamentally a tool for outsiders. She made distinction between a lived experience and the planner as an outsider which have completely different approach and understanding of space.

> “I want to share an experience of making maps with vulnerable groups. My experience of working with child labour groups as well as with prostitutes and gypsy communities which was part of my thesis. My study drew me to a conclusion that

> it is not possible to work with such groups in making a map. The reason was not because those groups don't understand their neighbourhoods or the environment they live in. In fact, they have a broader understanding of their habitat in comparison with two-dimensional view of the place. […] Working with the children of labour, showed that they have a very deep understanding of their habitat but they are not able to convert it to two-dimensional perspective. [… in the end] we couldn't reach an outcome in a form of map, the reason in our opinion was that mapping reduces a lot of space features that they didn't accept as a form of understanding of the space. Therefore, I think the map and mapping practices are made for outsiders, it is a tool for those who see the space from above. So, when we speak of the map we should also consider for who's point of view and for what purpose…." [Mehrnaz 01:34:00]

Responses to her points were interestingly on what is it to work with vulnerable groups and how planner's tools do not make a lot of sense for local communities. Once again, language of the map and planning language came as a metaphor. Discussions also came to seek for meanings in the very capacities of humans. Comparison ability, child's view of the world, value systems, meanings of life and happiness in opposition to poverty and so on framed philosophical responses in the group. All in which acknowledged the fixing or unifying character of the map in which the local communities do not usually relate to in the way mapmakers as outsiders may imagine.

The fixing character of map has interesting aspects into it. Kamal pointed to an experience saying:

> "when the new ToR was approved in the UDRO a new map with the title 'social map' was added. We didn't know what does that mean, therefore, we asked what is it? How is it look like? Then the respond was: in the social map the consultant should go to the neighbourhoods and map criminal spots which basically meant indicating places that gangsters control and create insecure spaces." [Kamal 2:41:10]

His statement points to earlier debate on the agency of mapping and planners hand in the making of it which due to technical difficulties of mapmaking (or inability of planner to come up with innovative approaches in engaging public participation) excludes the public in having a direct participation in the making of the map. The map, therefore, is incapable of projecting the social life in the kind of examples we see in Jiroft project. The social life and social events are mainly mobile and dynamic, whereas, the mapping technique used in Jiroft is essentially fixing and unifying concepts in time and space. There-

fore, social life and the process in which maps are made is what always get hidden in the mapping practices as we have seen in Jiroft project.

Kaveh also raised an interesting insight on how maps and mapmaking can be improved and have different effects on planning. He pointed to the fact that the language of mapping from visual presentation and the number of layers that the map can hold is indeed very poor in Jiroft project. His view is concerned with how mapping and map visual should and could include time dimension as well as fluid character of planning and the city.

> "[…] the language, of the map, is possible to be conducted in many formats. For instance, the language and the visuals can be improved tremendously. In the last 10-15 years, the language of mapping has changed a lot but these maps are very basic compare to what it can be. For example, on these maps we can put more layers and visualize the data, which communicates our knowledge and the process and not just the result. In fact, every sentence we say can be mapped. So, the number of maps can also grow up." [Kaveh: 03:14:40]

The two other planners from Sharestan company got to be silent most of the time since Mr. Sadri already had an answer to most of the points. Though, they also shared their opinions responsively. Meisam, went beyond mapping as a process in urban planning and referred to map effects in social level and pointed to the role of new technology in improving mapping. Here he criticised the regime of data production and failure of bureaucratic system to meet the technological development.

> "[…] we should also think about the role of technology in changing our understanding of space and the way we imagine it today. […] Everyone nowadays imagines the map of his/her house in a way Google Maps present it. […] maps here are in line with homogenising our understanding of the place and its functionality. One of the implication of this is related to how we have lost (or changed) our sensing of the place […]. That's all due to the complexity of the system. The system is a data consuming mechanism which fails to analyse them due to rapid development of data and slow bureaucratic process of taking actions. Not just that, there are other qualitative realities, which would never get represented in data oriented studies, especially in cities …." [Meisam: 01:46:37 - 01:53:30]

His rather broad philosophical statement points to contradictory nature of power and planning discourses and the role of planners as a mediator in this process. However, he tried to point to domination of technological development in relation to mapping and how maps became a daily device in people's life. Indeed, the absence of people in discus-

sions and in the way in which the map has an effect in their life was quite evident in the session. That is partly because of the FGD's set up, yet, it was also due to highly technical practices that mapping and planning involves which the experts took it as their own realm of expertise therefore the matter of concern for them.

5.3 Final remarks on the FGD

In describing the findings and making concluding remarks, I try to summarise the discussions around mapping practice in the FGD and draw a basic model for how the process looks like. Key discursive metaphor that had a strong presence in the discussions was 'map language'. Map language refers to the technical assemblages of what makes the map and the knowledge it tries to present. Data is the main ingredient for making maps and it is collected from various sources. We saw that how data come to play a role in identifying target areas as well as how claims on participation presented regeneration projects different than masterplan maps. Yet, the language of map translates data into what is the view or the concepts that planners try to speak of in the planning. Finally, the language of map depending on the scale of the map and the data that is building the knowledge based on, changes accordingly. Therefore scale, purpose and data are all interlinked in the making of maps. Review of maps in Jiroft project shows that the language used in the maps are visually not advanced and do not speak of neither the process nor the ways in which the map is made.

Maps, however, are limited to the purpose that they are made for. The map then either serves the purpose or fails to do so. The purpose in regeneration programmmes, is regarded as planning for the poor and improvement of socio-spatial condition of the people who live in such areas. Although, participation of actors in the process is acknowledged in the contract as well as with the consultancy's approach, yet, the people have no hands in making the maps. They come to be a source of data that in the end gets to be selected and picked up with the experts for the purpose that they seek to make the map.

The government as a crucial network maker shapes the process in which the purpose of actions that defines the structure of the work is made into the ToR. Then it is handed to the experts as mapmakers which are the central actors in making of maps. Mapmaking is essentially about geographical visualisation of data and the ways in which the knowledge is produced. Subsequently, maps as product of this process come to have various effects on the ways in which knowledge is presented to make decisions for the city and the target areas. Finally, users and citizens receive maps as official documents for city management

that has a role in making the reality of the place. The map makes the unplanned visible by series of knowledge and plans.

Nonetheless, the making of poverty visible by mapping as a bureaucratic practice has real consequences for the target areas. The people to some extent, and the authorities are aware that when some parts of the city are labelled informal settlements or decade fabrics that brings new opportunities for the place including benefiting from national mortgage fund for renovation and regeneration; another benefit that is immediately applied for IS after the areas are recognised as such is that they get a big discount in city tax for building new houses in the neighbourhood. We have seen the performative, representational and enactment of poverty in Jiroft is made real in the way it is constructed in the web of material, semiotic and practices of planning. Although, it has constructed but it has real consequences for the target areas and people who live in there. In a sense the enactment of poverty in regeneration programme (section 5.2.2) formalises the informal settlements in which the *nomadic assemblage* of the unplanned is transferred into *static assemblage* by the means of policies and recognition of the target areas for and by the state.

Chapter 6 Conclusion

The work of putting together this thesis has proceeded over several months. I had first to do the work of getting an understanding of the intersection of STS and urban studies. Then I reflected on my long-lasting interest in maps and mapping. And finally, the making of a research project that has connection to my past professional experience. Indeed, I had a challenging work of constellating various settings, not limited but including: literature, theory, method, practice, messiness of research, academic life and writing in a foreign language. Nevertheless, this experience has been worth doing. Challenges and findings of this research at the end of the journey made me even willing to think forward to expand the work into other dimensions that I could not deal with in this research. Here, in the concluding chapter I reflect on both the journey of doing this research and the takeaways. In the end, I draw what may be proposals for further investigation and development in the future.

The chapter is structured in four sections. First, I elaborate on the findings of the research and the framing of the notion of 'urbanising poverty' in the mapping assemblage in Jiroft regeneration project. Second, I reflect on theoretical lessons and findings of this research. I particularly discuss how assemblage thinking in combination with ANT attributes to the ways in which the relation of the city, the map and mapping can be contextualised and decontextualised. Third, I turn the critique of doing the research from the viewpoint of methods applied in this research. I attempt to explain situatedness of this research and myself in the specific context of doing research in and out of Iran. Also, I try to acknowledge the normative and the performativity of doing research in this project. Last not the least, I comment on some of the restrictions and shortcomings of this research in using theories and methods. But with a view on making suggestions and sharing thoughts for further development in the future.

6.1 Urbanising poverty

This study set out to explore mapping assemblage in Jiroft regeneration programme as political project of eradicating poverty in Iran. We have seen that regeneration programmes throughout its development organised a series of initiative to frame poverty as

an urban issue, therefore, involving urban planners to conduct studies, identify poor areas, make plans and produce maps within the purpose and the framework of regeneration programme. The most obvious finding to emerge from this study is that: mapping makes poverty visible in the eyes of authorities. Then the map calls for attention and proposes actions to be taken about specific parts of the city that are labelled as the informal or the unplanned. Such a function, forms a network of actors to mobilise resources to bring changes in the living conditions of the target areas. This study has shown that mapping in regeneration programmes transforms the notion of poverty into a new framing. Poverty after regeneration programmes becomes an urban matter; meaning it gets translated into a spatial matter rather than an individual and/or a social matter, in other words "urbanising poverty". In short, the regeneration programmes agenda problematises poverty as an urban matter. Such programmes of action, defines poverty in geographical limits visible to the officials' eye. Therefore, assemblages of urban poverty in regeneration programmes have two main functions: urbanising poverty, and making poverty officially visible.

The purpose of mapping in Jiroft regeneration programme as the continuation of the World Bank initiative with the MURD, as we have seen in this study, is an administrative ordering of the society set out within the high-modernist ideology (Scott 2008). High modernist in this account is a turn in post-industrial era that a strong confidence is put on scientific and technological progress (p.4). In this agenda, everything is subjected to rational planning and a perfect order. Such a programme has two main implications as far as this study examined in the Jiroft project; the administrative ordering implies mapping through the expertise employed by the state which has the capacity for large scale social engineering; the high-modernist agenda then sets out the desire and the determination to act on it; mapping in the end translates and transforms the purpose into desires which is social engineering and administrative order. James Scott once again observes similar processes but through the writings of Jane Jacobs, an urban sociologist and urbanist. Jacobs critique of such ordering is based on how high-modernist agenda sacrifices functional order for aesthetic order. Jacobs writs on slum clearance as high-modernists aesthetic order. For Jacobs the unsluming of slums is a process in which the unplanned cannot be planned by the order of aesthetic, scientific and practical planning approach. Slums and urban neighbourhoods are a social organism that is alive and brings surprises all the time (p.74).

Mapping in Jiroft regeneration, nonetheless, has all the character of state simplification (Scott 2008). State simplification as Scott (2008) puts it include: "maps, censuses, cadas-

tral lists, and standard units of measurement represent techniques for grasping a large and complex reality; in order for officials to be able to comprehend aspects of the ensemble, that complex reality must be reduced to schematic categories. The only way to accomplish this is to reduce an infinite array of detail to a set of categories that will facilitate summary descriptions, comparisons, and aggregation (p.77)." A state with no simplified knowledge of its society would be a crude state that loses its eligibility to act and take action. Urbanising poverty has the same approach in framing poverty in an urban context. Something that is not solely form the national agenda but rather a universal simplification of a phenomenon as global.

Mapping, as such, then is a mechanism, a device and a technology that provides legibility for states to translate a problem to matter of fact. The product is then what Scott calls "state maps of legibility". He describes this as: "Legibility implies a viewer whose place is central and whose vision is synoptic (p.79)." In Jiroft regeneration mapping and maps are the kind of state simplifications. We have examined maps are designed to provide authorities with a schematic view of their society and the people and places that they are targeting. This is a view not afforded to those without authority and power. Consultants in this regard serve the state in the process of simplification of poverty in an urban context. However, this privileged vantage point, Scott adds "is typical of all institutional settings where command and control of complex human activities is paramount (p.79)." Finally, as we have seen mapping assemblage is designed for a purpose which is set out by those who employ mapmakers to serve it. Such process in this study turned out not to be reflected on the map. So, the main effect of the map is again making poverty as a spatial reality visible to the authorities.

6.2 How did the theories contribute to the findings?

Drawing on the hypothesis of this study. It is, in my opinion, important to examine how literature and theoretical framework contributed into understanding of the situation in Jiroft regeneration project. In the first glance, reading of STS and the city literature helped me to contextualise the object of the study and draw research enquiries out of the experiences examined before. It also helped the study to be sensitive on specificities and conceptual frameworks. Literature and theories applied in this study feed thoughts in the relational constellation of what is the urban; what is the map; what is mapping; and how to look at them in relation to one another.

In the first level, the urban as an object of study is a vast empirical site which can be looked in numberless ways. Though, the urban as an enquiry in STS has been look at in

more specific manners concerning the relation of the city, technologies and the social lives. I followed Farías and Blok (2017) guide in understanding of city and STS which led me to embrace relationality, multiplicity, assemblages and agencements in the process of constant becoming. As such, ANT with its instrumental toolkit, yet relational analysis method, came to be the best method for studying expertise, mapping, urban poverty and the making of it. ANT equipped this study to rethink spatiality, studio as knowledge making space and the notion of translation in the process of mapping in Jiroft. Additionally, this research showed how mapping process in Jiroft regeneration programme is performative and enacted based on the purpose it serves.

The second level, maps as an object and a tool for knowledge making and understanding of the spatiality of social orders have different implications. Mapping is fundamentally a visualisation practice for knowledge making which involves different actors and actants. Yet maps as the final product in this study, appear to be either documents and a language in regeneration programmes. Maps are, then, inscription devices that are immutable and mobile. Here, ANT studies and terminologies helped the research to employ concepts and descriptions that could explain the process per se. Yet, beyond the instrumental use of ANT, maps have the character of an assemblage. Map assemblage in Jiroft regeneration programme is a transition between different types of assemblages.

In this study, I identified the unplanned or the informal settlements as nomadic assemblages in which conditions, elements and agencies without (or with less) limits can change. Informal urban fabrics, as such, resist formal assemblages set ups that are forced by the state. Albeit, they are still part of the urban assemblage but not at the same time. That means, such urban areas share many characteristics of the city but they also lack some others. Map assemblages in regeneration programmes is an attempt to reconfigure the nomadic assemblages into the state assemblages and further to the capitalist assemblages. Maps reassemble the sociospatial order of the place based on the regeneration programme's purpose. Finally, after the map is produced the target areas fall back into the nomadic assemblage although they carry different meanings. The process is a circular pattern of transition– always in the becoming with no *a prior*.

In the third level, mapping assemblage is the process of making maps in regeneration programmes. We have seen that mapping assemblages, much like translation process in ANT, transforms the purpose as a shared matter. Then the matter is problematised as an issue in a process in which other elements and agencies relate to each other. Mapping, as such, takes the nomadic assemblages out of its territory and makes it a static assemblage at least for the purpose of regeneration programme. In the end, mapping assemblages

adds into the uncertainty of the situation. Such framings and findings were not possible without thinking assemblage in this study.

6.3 Restrictions of theory and method in this research

Following the debate on the use of theories in this study, here, I briefly reflect on my experience of using assemblage thinking in combination with ANT to share some of restrictions and benefits of using the two together. Then I elaborate on situational analysis method to show how I see both theory and method in relation to one another. In the end, I try to propose some suggestions for improvement of the two together especially in practice and how more advanced techniques are needed to fill the gap between assemblage and ANT as theories and SA as method can be tackled more productively.

On the theoretical level, ANT is quite instrumental and practical in framing a research whereas assemblage is quite abstract and difficult to understand specially as an enquiry in STS scholarship. Yet I think that is the character of assemblage thinking to not give a prior to anything and keep the possibility of becoming always open and on the making. Assemblage thinking as a radically relational theory (like ANT) invites researcher to seek for specific agencies and elements and focus on the relations they make together in the situation of enquiry. Albeit, ANT has also similar ontological stand as in assemblage; but it provides a heavily empirical basis for analysis and ethnomethodologically oriented examples particularly in STS which makes the research more constructive. ANT studies indeed provide a concrete ground for conducting research. They show how studies take place and offer a rich set of notions and concepts for explaining and contextualising scientific practices and so on. The combination of the two, however, benefited me in expanding the research enquiry not just into practice of mapping but to theoretically defining mapping and informal settlements as nomadic assemblages and the characteristics such constellation may hold. Furthermore, political criticism inherent in assemblage thinking led the attention to political relations in regeneration programmes and mapping and planning in general. Such power practice and relation in the case of Jiroft resonated postcolonial theories which for the reasons, which I will point out, this study did not go deep into that realm. In fact, mapping is a technology practiced by the powerholders to colonise informal settlements by changing those areas from nomadic assemblages to state assemblages. Hence, such relation is circular and not fixed as the practice of mapping is essential fixing visually presented knowledge in a time on a geographically represented location.

In this research, I tried to think of theory as an assemblage by combining different theories and methods together. In fact, I wonder why theory is not looked at as an assemblage. Theory-method combined is an assemblage. I think the initiative in situational analysis as theory-method package offers such an approach in social science research. However, situational analysis has its own shortcomings in offering an advanced tool for a radical and rhizomatic analysis.

SA and its mapping techniques fall into the same simplification agenda of mapping (Scott 2008) by fixing elements in the web of relations and then focusing on how and why other elements relate to the focus. Such simplification is linear and one dimensional. On the one hand, this helps to keep track of the focus of analysis; so much like ANT seeks for actors and actants networks in the situation. On the other hand, situational maps make the researcher to think about different aspects of the research and the situation and think of things that are not acknowledged or got silent. Such blind-spots come to be a turning point in the research in which they introduce an unexpected fact in the research. In Jiroft for example, the relation between data and participation made me think of participation as an approach in collecting data and therefore reducing participation to a source of data.

Nonetheless, such linear relations stand in opposition to assemblage thinking and rhizomatic thinking. In assemblage thinking and ANT to some extend the theory emphasises on the complicated web of relations that can be traced from any point in the network. In this respect, SA mapping techniques visually does not offer rhizomatic analysis in the way it tries to find relations among the research elements. What I mean is that SA mapping is highly two dimensional. It flattens relations which visually misses to project interconnectedness of actors and actants. I think SA may need to employ more advanced mapping technology and software to overcome such shortcomings. Indeed, that may be a collaboration between STS scholars and technicians to bring design and technology as devices of analysis in social sciences. Thinking of innovative ways of bridging theory and method may well be achievable through technology and computer applications. In the final section I list a series of ideas that I hope can be perceived as future development in this study and beyond.

6.3.1 Lessons from the FGD

There is always lessons to learn. There are a few lessons that I learnt by the FGD experience. First thing is that I wish that I had a better understanding of the historical development of planning in Iran, so that, I could respond to some of the debates in a better way. I also wish we had participants from municipality which would have changed the

dynamic of the discussions into implementation phase and the map users. At one point, I was not prepared to answer questions regarding the history of mapping, which was mentioned right at the beginning. Nonetheless, the FGD created a space for dialogue and exchange of ideas and topics among a group of experts which added interesting dynamic into the research material. In fact, such group dynamic changed the flow of questions and the presumptions in the research into new aspects. All this is related to my own role in the process as I mentioned before. Kathy Charmaz (2015), in the introduction of the new Situational Analysis book by Adele Clarke, states that:

> "The assumptions we hold, the actions we take, the data we generate, and the analyses we construct all reside within the situation of enquiry. No longer can researchers hide behind data and present their findings as objective facts separate from the conditions of their production. Every study develops within a situation and likely is transformed by multiple situations throughout enquiry." (original emphasis, p.8)

The FGD, thus, was as performative as mapping in Jiroft regeneration programme. The FGD does not represent the universal take on any knowledge but a specific planning culture in a specific context. In fact, I am part of that planning culture and there is a strong personal relation between me and the participants. That means they all know me and had worked with me before. I think it is, yet, a strength in the way I managed to collect materials for this research. I particularly, enjoyed the FGD set up as a space for dialogue and debate. Latour (2015) provides a methodology for arriving at a participatory construction of the collective stating: "sociology is best defined as the discipline where participants explicitly engage in the reassembling of the collective (p.247)." I believe the FDG set up helped me to overpass the personal boundaries with each of the participants by shifting it to a group dynamic.

6.4 The political and the normative critique of doing research

We have seen the situatedness of mapping in regeneration programme in Jiroft City. The study has showed that how mapmaking in Jiroft regeneration programme performs the making of poverty far away from the actual place in the urban studio. I employed the notion of 'performativity' to explain how mapping as a technoscientific practice is shaped, but also shapes the social. In line with assemblage thinking I discussed that theory and method help to frame the situation and start the analysis the relations and elements in the situation. The research enquiry then was to find out how method and the practice of mapping in Jiroft is staged; and what does it show and not. Here, though, I attempt to

acknowledge the situation of the research and myself in the research as equally performative practice. In the following, I situate the research based on the notion of *location* (Law 2017; Law and Lin 2017) and different spaces of knowledge in this research.

John Law (2017) reviews STS as method and the ways in which STS evolved with and through empirical studies and examples. He clarifies the shift in different strands of conceptual frameworks in STS and adds an emphasis on situatedness of doing research in social sciences as of any other scientific knowledge making. He quotes Donna Harraway's argument in rejecting objectivity in science; in her account "knowledges and methods are situated. The stories they tell about the world necessarily both reflect their location and reproduce social agendas." (Haraway 1988, as cited in Law 2017, p.35). This, he continues, is not to object science. Hence, all researchers and researches are located somewhere. Subsequently, Haraway proposes two methodological and political moves to hang on objectivity in social sciences, which is always 'partial' in her account. First, to acknowledge the social location of the research and the researcher. Second, to treat the location and its prejudices and blind-spots as a matter of critical enquiry in its own right. The idea is that, Law concludes, "knowledge makers are part of what they study and that their methods should reflect this (p.35)." In the following I elaborate on such moves in this study.

In the beginning, I should describe the two-fold character of location in this research. One is the geographies that this research takes place– Iran and Austria. The context of the research is based on a case study in Iran: more precisely the location of the study is a consulting company who did the mapping and planning for Jiroft regeneration programme which is also far away from the urban studio. The consultancy, of course, conducted the research by a group of consultants in collaboration with other actors during the life of the project. The other geography is Vienna and the STS department in the Vienna University where this research is written for. Let's see how these two locations connect in this research.

As mentioned before, the data extracted for this research is based on three sources: the FGD, the ToR and Sadri's book, which are all in Farsi. Yet, the writing of this thesis and all the sources of theoretical and conceptual frameworks are in English. Most obvious, the issue of language and translation hangs around all the time. Translation, however, is not limited to interpreting the findings from Farsi to English and then writing about it. Translation in this research has another pathway in which western theories and ontologies are transferred to a non-western context. That is, to initially make sense of the situation from STS ontological politics (Mol 1999) in the research and then applying it to the

context of the study. In this respect, my task was to detach the theories from the practice in which they are embedded and moved elsewhere. A series of questions rise in such transition which Law and Lin (2017b) as well as Anderson (2017) point to. Authors question translation and politics of methods that feed into power relation of doing STS in the non-western world: "to what extend one can translate words and avoid normative framing of theory and method in social science? (Law and Lin 2017b, p.259)." Law and Lin (2017a), in this vein, propose a new programme, which they frame it as: "Provincialisation of STS", in which they invite researchers to move towards a third symmetry in STS. The first two symmetries were flattening of the social/the technical and the human/non-human especially in ANT-inflected studies. The third turn is then a postcolonial one, in which research gives an equal role to terms, concepts and notions from non-western sites to be applied to academic world. The critique, as such, builds on postcolonial moments in STS (Verran 2002). Postcolonial moments embrace difference and sameness as a departing moment to experience a new ground for dialogue and new spaces of knowledge making. Such move inspired me to take a self-critique of doing research from a postcolonial stand point, although, the study is not framed as postcolonial study. I reflect on such moves in this research and explain the location of the research and myself as the researcher.

Acknowledging my own social location in the research. I'm a trained planner and I worked in similar project in the same consultancy. In this situation, I had some advantages and disadvantages. My previous experience has benefited me to be able to organise a good set up regarding the case study and inviting participants for the FDG. In fact, the participants were all among most famous professionals in their own field. Also, having had participants from the government agency also had a deep impact on the findings of the research, which is not usually an easy task in Iran's political environment. Furthermore, my understanding of the practice also gave me the chance to refer to my own experience whenever I felt the data in the research lacks clarity. However, such environment of familiarity also had effects on the ways in which I did moderate the FGD as well as the type of questions that I posed in the group. Participants based on the knowledge that they have about me did not bother to explain the process in detail. This had also brought boundaries for me as a researcher to not notice some of the blind-spots of the research. Though, the situation of the research both gave me a deep insight in doing the research as well as reminding myself of being cautious of falling into normative in doing the research as an expert in this field myself.

The other aspect of locating the research, as I mentioned earlier, is doing research in a non-western context equipped with most progressive theoretical frameworks in STS. Law, Lin, Anderson and other have nicely contextualise such an issue in the EASTS magazine volume 11 November 2, 2017. I see myself in a similar situation where I spontaneously travelled in between the two worlds in the research. The move is both linguistic and geographic. And it involves power relations. Translation is the most obvious one, but geographies and power relation is constantly shifting from the hegemony of western power practice in mapping and cartography as well as western ontological domination and politics in the academy. This research realised few postcolonial relations and moments in mapping and regeneration programmes throughout the research (e.g. the genesis of planning and regeneration programmes in Iran; Sadri's experience of observing the beginning of mapping and planning practices). Yet, I decided to step away from such relations and moments for several reasons. To begin with, postcolonial studies aim for a dialogue bridging similarities and difference, presence and absence and embracing different spaces of knowledge (Herran 2002). In this respect, I found it difficult to decontextualise the object of study into spaces of knowledge in the case of Jiroft regeneration programme. In fact, it was difficult to frame the colonial moments evident and clear in the process, since the whole process of regeneration and expertise is highly hegemonic and standardised. Such enquiry demands a greater effort to map the different spaces and then investigating into postcolonial or decolonial forms of different practices. Perhaps greater amount of time and effort is needed to seek for such move, but this stays a highly interesting field for me. A quick respond to expand such a dimension would be to engage the map users in the research which this research did not step into. Another move in this regard would have been searching for other practices of designing and planning cities in Iran, which is known for its historical and Islamic architecture. Searching for methods and practices of mapping and planning in those times and finding the remaining signs of it would have been very interesting.

From a personal point of view there are also some prejudices of thinking postcolonial. I was concerned with falling into cultural bias of being an Iranian and not being able to critically examine the situation of enquiry in this research. So, I found it difficult for the size and the time of this research to open such a concern and stay cautious.

6.5 Future development

Dodge, Kitchin and Perkins (2011) propose new topics and areas for map studies. The authors discuss that mapping technology is a rapidly changing field which brings new and interesting aspects into mapping as sites of investigation and research. Based on the

findings of this research I adopt some of their propositions in order to propose further development in this study. The most evident one is 'screen spaces' and the shift from paper maps to digital maps. We have seen in Jiroft how the visual language of maps failed to communicate its purpose in some cases. This study drew a strong relation between the language of the map, the purpose and the scale of planning. However, such a relation is not the same in digital maps and on screen spaces which the scale is almost a matter of zooming in and out. In fact, 'being on screen' (p.222) is a whole new language of mapping accompanied with different visual cultures. Even limited to regeneration programmes such a visual culture would vary from consultancy to consultancy and the UDRO as an institute standardising such a visual language.

Furthermore, the language of the map has also become digitalised. Algorithms of mapping and AI based on big data are creating not just a new map language but a new set of space perception and space production. Such shift has been theorised as 'automatic production of space' (Thrift and French 2002 as cited in Dodge, Kitchin and Perkins 2011, p.223). Such technologies provide enormous possibilities of participation and agency in mapmaking which in turn changes the whole notion of planning from power-laden to bottom-up approach. Yet, such becoming has new issues such as authorship of mapping, new infrastructures of mapping and mass surveillance. These new actors and events, construct new inquiries to materiality, political economy, effect and ethnography in mapping studies (p.229); as well as moments of mapping in which human interaction with maps become both subject and object of study (p.234).

In this light, one rather conceptual enquiry that I propose for further investigation is: how data can have an active agency in the making of maps and not only as components of maps. We have seen in this study that participation in the process was a matter of collecting data for the purpose of regeneration. Hence, data is quantification of human action and the human condition fixed and translated into numbers. Data as an active agency means involving the subject into the object in the process of mapping. New technology of mapping extends time into constant access to data and update. Therefore, an emancipatory approach into power relation in mapping would mean giving data agency in the way the people are not only data in the making of maps but also an active participant in the ways in which maps are produced to provide decisions and plans for their lives. Such approach also needs to reformulate agency as a process in which it is also in constant becoming and in the constant changing web of relations.

References

Aibar, E., & Bijker, W. E. (1997a). Constructing a City: The Cerdà Plan for the Extension of Barcelona. *Science, Technology, & Human Values*, *22*(1), 3–30. https://doi.org/10.1177/016224399702200101

Aibar, E., & Bijker, W. E. (1997b). Constructing a City: The Cerdà Plan for the Extension of Barcelona. *Science, Technology, & Human Values*, *22*(1), 3–30. https://doi.org/10.1177/016224399702200101

Alaedini, P., "CITIES vi. Urban Informal Settlements in Modern Iran," *Encyclopædia Iranica,* online edition, 2015, available at: http://www.iranicaonline.org/articles/cities-06-settlements (accessed on 28 October 2016).

Alexander, E. R. (2016). There is no planning—only planning practices: Notes for spatial planning theories. *Planning Theory*, *15*(1), 91–103. https://doi.org/10.1177/1473095215594617

Allen, J., & Cochrane, A. (2007). Beyond the Territorial Fix: Regional Assemblages, Politics and Power. *Regional Studies*, *41*(9), 1161–1175. https://doi.org/10.1080/00343400701543348

Anderson, B., Kearnes, M., McFarlane, C., & Swanton, D. (2012). On assemblages and geography. *Dialogues in Human Geography*, *2*(2), 171–189. https://doi.org/10.1177/2043820612449261

Anderson, B., & McFarlane, C. (2011). Assemblage and geography: Assemblage and geography. *Area*, *43*(2), 124–127. https://doi.org/10.1111/j.1475-4762.2011.01004.x

Anderson, B. R. O. (1983). *Imagined communities: reflections on the origin and spread of nationalism*. London: Verso.

Anderson, W. (2017). Postcolonial Specters of STS. *East Asian Science, Technology and Society*, *11*(2), 229–233. https://doi.org/10.1215/18752160-3828937

Assembling the Everyday: Incremental Urbanism and Tactical Learning. (2011). In C. McFarlane, *Learning the City* (pp. 32–61). Oxford, UK: Wiley-Blackwell. https://doi.org/10.1002/9781444343434.ch2

Bier, J. (2017). *Mapping Israel, mapping Palestine: how occupied landscapes shape scientific knowledge*. Cambridge, MA: The MIT Press.

Brenner, N. (2000). The Urban Question: Reflections on Henri Lefebvre, Urban Theory and the Politics of scale. *International Journal of Urban and Regional Research*, *24*(2), 361–378. https://doi.org/10.1111/1468-2427.00234

Brenner, N. (2009). What is critical urban theory? *City*, *13*(2–3), 198–207. https://doi.org/10.1080/13604810902996466

Brenner, N., & Elden, S. (2009). Henri Lefebvre on State, Space, Territory. *International Political Sociology*, *3*(4), 353–377. https://doi.org/10.1111/j.1749-5687.2009.00081.x

Brenner, N., Madden, D. J., & Wachsmuth, D. (2011). Assemblage urbanism and the challenges of critical urban theory. *City*, *15*(2), 225–240. https://doi.org/10.1080/13604813.2011.568717

Brenner, N., & Schmid, C. (2014). The 'Urban Age' in Question: The 'urban age' in question. *International Journal of Urban and Regional Research*, *38*(3), 731–755. https://doi.org/10.1111/1468-2427.12115

Brenner, N., & Schmid, C. (2015). Towards a new epistemology of the urban? *City*, *19*(2–3), 151–182. https://doi.org/10.1080/13604813.2015.1014712

Bryant, A., & Charmaz, K. (Eds.). (2011). *The SAGE handbook of grounded theory* (Paperback ed., reprinted). Los Angeles, Calif.: Sage Publ.

Callon, M. (1984). Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay. *The Sociological Review*, *32*(1_suppl), 196–233. https://doi.org/10.1111/j.1467-954X.1984.tb00113.x

Callon, M., Law, J., & Rip, A. (Eds.). (1998). *Mapping the dynamics of science and technology: sociology of science in the real world* (transferred to digital printing). Houndmills: Macmillan.

Castells, M. (1979). *The urban question: A marxist approach. Transl. by Alan Sheridan* (1. MIT Press paperback ed). Cambridge, MA: MIT Press.

Clarke, A. E. (2003). Situational Analyses: Grounded Theory Mapping After the Postmodern Turn. *Symbolic Interaction*, *26*(4), 553–576. https://doi.org/10.1525/si.2003.26.4.553

Clarke, A. E. (2005). *Situational analysis: grounded theory after the postmodern turn*. Thousand Oaks, Calif: Sage Publications.

Clarke, A. E., Friese, C., & Washburn, R. (Eds.). (2015). *Situational analysis in practice: mapping research with grounded theory*. Walnut Creek, California: Left Coast Press.

Clarke, A. E., Friese, C., & Washburn, R. (2018). *Situational analysis: grounded theory after the interpretive turn* (Second edition). Los Angeles: SAGE.

Corner, J. (2011). The Agency of Mapping: Speculation, Critique and Invention. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader* (pp. 89–101). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587.ch12

Coutard, O. (Ed.). (1999). *The governance of large technical systems*. London ; New York: Routledge.

Crampton, J. W., & Elden, S. (2007). *Space, Knowledge and Power: Foucault and Geography*. Farnham: Ashgate Pub. Retrieved from http://public.eblib.com/choice/publicfullrecord.aspx?p=429597

Davis, M. (2007). *Planet of slums* (Paperback ed). London ; New York: Verso.

de Laet, M., & Mol, A. (2000). The Zimbabwe Bush Pump: Mechanics of a Fluid Technology. *Social Studies of Science*, *30*(2), 225–263. https://doi.org/10.1177/030631200030002002

De Landa, M. (2006). *A new philosophy of society: assemblage theory and social complexity*.

Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: capitalism and schizophrenia*. Minneapolis: University of Minnesota Press.

Dodge, M., Kitchin, R., & Perkins, C. (Eds.). (2011a). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587

Dodge, M., Kitchin, R., & Perkins, C. R. (Eds.). (2011b). *Rethinking maps: new frontiers in cartographic theory* (Paperback ed). London: Routledge.

Dovey, K. (2010). *Becoming places: urbanism/architecture/identity/power*. London ; New York: Routledge.

Edney, M. H. (2011). Cartography without 'Progress': Reinterpreting the Nature and Historical Development of Mapmaking. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader* (pp. 73–82). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587.ch10

Farías, I. (2011). The politics of urban assemblages. *City*, *15*(3–4), 365–374. https://doi.org/10.1080/13604813.2011.595110

Farías, I., & Bender, T. (Eds.). (2011). *Urban assemblages: how actor-network theory changes urban studies* (1st issued in pbk). London: Routledge.

Farías, I., & Blok, A., (2017). STS in the City. In Ulrike Felt, Rayvon Fouché, Clark A. Miller, & Laurel Smith-Doerr (Eds.), *The handbook of science and technology studies* (Fourth edition) (pp. 555-581). Cambridge, Massachusetts: The MIT Press.

Farias, I., & Wilkie, A. (Eds.). (2016). *Studio studies: operations, topologies and displacements*. London ; New York: Routledge, Taylor & Francis Group.

Foucault, M. (1991). 'Governmentality', trans. Rosi Braidotti and revised by Colin Gordon, in Graham Burchell, Colin Gordon and Peter Miller (Eds.) The Foucault Effect: Studies in Governmentality, (pp. 87–104). Chicago, IL: University of Chicago Press.

Foucault, M., Burchell, G., Gordon, C., & Miller, P. (Eds.). (1991). *The Foucault effect: studies in governmentality: with two lectures by and an interview with Michel Foucault*. Chicago: University of Chicago Press.

Foucault, M., & Rabinow, P. (1984). *The Foucault reader* (1st ed). New York: Pantheon Books.

Goonewardena, K. (2009). Urban studies, critical theory, radical politics: Eight theses for Peter Marcuse. *City*, *13*(2–3), 208–218. https://doi.org/10.1080/13604810902982219

Goonewardena, K., & Kipfer, S. (2013). Urban Marxism and the Post-colonial Question: Henri Lefebvre and 'Colonisation'*. *Historical Materialism*, *21*(2), 76–116. https://doi.org/10.1163/1569206X-12341297

Graham, S. (2002). On Technology, Infrastructure and the Contemporary Urban Condition: A Response to Coutard. *International Journal of Urban and Regional Research*, *26*(1), 175–182. https://doi.org/10.1111/1468-2427.00371

Graham, S., & Marvin, S. (2001). *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. London ; New York: Routledge.

Guggenheim, M. (2009). Building memory: Architecture, networks and users. *Memory Studies*, *2*(1), 39–53. https://doi.org/10.1177/1750698008097394

Guggenheim, M., & Söderström, O. (Eds.). (2010). *Re-shaping cities: how global mobility transforms architecture and urban form*. London ; New York: Routledge.

Harley, J. B. (2011). Deconstructing the Map. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader* (pp. 56–64). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587.ch8

Hodgson, E. K., & Fridovich, I. (1975). The interaction of bovine erythrocyte superoxide dismutase with hydrogen peroxide: inactivation of the enzyme. *Biochemistry*, *14*(24), 5294–5299.

Hommels, A. (2005). Studying Obduracy in the City: Toward a Productive Fusion between Technology Studies and Urban Studies. *Science, Technology, & Human Values*, *30*(3), 323–351. https://doi.org/10.1177/0162243904271759

Hommels, A. (2008). *Unbuilding cities: obduracy in urban socio-technical change* (1. paperback ed). Cambridge, Mass.: MIT.

Hughes, T. P. (1983). *Networks of power: electrification in Western society, 1880-1930*. Baltimore: Johns Hopkins University Press.

Hull, M. S. (2016). *Government of paper: the materiality of bureaucracy in urban Pakistan*. Retrieved from http://dx.doi.org/10.1525/california/9780520272149.001.0001

Kamalipour, H., & Peimani, N. (2015). Assemblage Thinking and the City: Implications for Urban Studies. *Current Urban Studies*, *03*(04), 402–408. https://doi.org/10.4236/cus.2015.34031

Kanai, J. M., & Kutz, W. (2013). Entrepreneurial assemblages from off the map: (trans)national designs for Tangier. *Environment and Planning D: Society and Space*, *31*(1), 80–98. https://doi.org/10.1068/d20311

Kärrholm, M. (2013). Building Type Production and Everyday Life: Rethinking Building Types through Actor-Network Theory and Object-Oriented Philosophy. *Environment and Planning D: Society and Space*, *31*(6), 1109–1124. https://doi.org/10.1068/d15312

Kitchin, R., & Dodge, M. (2007). Rethinking maps. *Progress in Human Geography*, *31*(3), 331–344. https://doi.org/10.1177/0309132507077082

Klauser, F., Paasche, T., & Söderström, O. (2014). Michel Foucault and the Smart City: Power Dynamics Inherent in Contemporary Governing through Code. *Environment and Planning D: Society and Space*, *32*(5), 869–885. https://doi.org/10.1068/d13041p

Knorr-Cetina, K. (1981). *The manufacture of knowledge: an essay on the constructivist and contextual nature of science*. Oxford ; New York: Pergamon Press.

Latour, B. (1987). *Science in action: how to follow scientists and engineers through society*. Cambridge, Mass: Harvard University Press.

Latour, B. (1990). Technology is Society Made Durable. *The Sociological Review*, *38*(1_suppl), 103–131. https://doi.org/10.1111/j.1467-954X.1990.tb03350.x

Latour, B. (2003). *Science in action: how to follow scientists and engineers through society* (11. print). Cambridge, Mass: Harvard Univ. Press.

Latour, B. (2005). *Reassembling the social: an introduction to actor-network-theory*. Oxford ; New York: Oxford University Press.

Latour, B. (2011). Drawing Things Together. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader* (pp. 65–72). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587.ch9

Latour, B., & Hermant, E. (n.d.). Paris: Ville Invisible | Paris: Invisible City. Retrieved 18 January 2018, from http://www.bruno-latour.fr/virtual/index.html

Latour, B., & Woolgar, S. (1979). *Laboratory life: the social construction of scientific facts*. Beverly Hills: Sage Publications.

Law, J. (Ed.). (1986). *Power, action, and belief: a new sociology of knowledge?* London ; Boston: Routledge & Kegan Paul.

Law, J. (1994). *Organizing modernity*. Oxford, UK ; Cambridge, Mass., USA: Blackwell.

Law, J. (2002). *Aircraft stories: decentering the object in technoscience*. Durham, NC: Duke University Press.

Law, J. (2004). *After method: mess in social science research*. London ; New York: Routledge.

Law, J. (2009a). Actor Network Theory and Material Semiotics. In B. S. Turner (Ed.), *The New Blackwell Companion to Social Theory* (pp. 141–158). Oxford, UK: Wiley-Blackwell. https://doi.org/10.1002/9781444304992.ch7

Law, J. (2009b). Seeing Like a Survey. *Cultural Sociology*, *3*(2), 239–256. https://doi.org/10.1177/1749975509105533

Law, J. (2017). STS as Method. In Ulrike Felt, Rayvon Fouché, Clark A. Miller, & Laurel Smith-Doerr (Eds.), *The handbook of science and technology studies* (Fourth edition) (pp. 31-57). Cambridge, Massachusetts: The MIT Press.

Law, J., & Lin, W. (2017a). Provincializing STS: Postcoloniality, Symmetry, and Method. *East Asian Science, Technology and Society*, *11*(2), 211–227. https://doi.org/10.1215/18752160-3823859

Law, J., & Lin, W. (2017b). The Stickiness of Knowing: Translation, Postcoloniality, and STS. *East Asian Science, Technology and Society*, *11*(2), 257–269. https://doi.org/10.1215/18752160-3823719

Law, J., & Mol, A. (2001). Situating Technoscience: An Enquiry into Spatialities. *Environment and Planning D: Society and Space*, *19*(5), 609–621. https://doi.org/10.1068/d243t

Law, J., & Mol, A. (Eds.). (2002). *Complexities: social studies of knowledge practices*. Durham: Duke University Press.

Leuenberger, C., & Schnell, I. (2010). The politics of maps: Constructing national territories in Israel. *Social Studies of Science*, *40*(6), 803–842. https://doi.org/10.1177/0306312710370377

Mcfarlane, C. (2010). The Comparative City: Knowledge, Learning, Urbanism: The comparative city: knowledge, learning, urbanism. *International Journal of Urban and Regional Research*, *34*(4), 725–742. https://doi.org/10.1111/j.1468-2427.2010.00917.x

McFarlane, C. (2011a). Assemblage and critical urbanism. *City*, *15*(2), 204–224. https://doi.org/10.1080/13604813.2011.568715

McFarlane, C. (2011b). Encountering, describing and transforming urbanism: Concluding reflections on assemblage and urban criticality. *City*, *15*(6), 731–739. https://doi.org/10.1080/13604813.2011.632901

McFarlane, C. (2011c). On context: Assemblage, political economy and structure. *City*, *15*(3–4), 375–388. https://doi.org/10.1080/13604813.2011.595111

Mcfarlane, C. (2011). The city as a machine for learning. *Transactions of the Institute of British Geographers*, *36*(3), 360–376. https://doi.org/10.1111/j.1475-5661.2011.00430.x

McFarlane, C. (2011d). The city as a machine for learning: The city as a machine for learning. *Transactions of the Institute of British Geographers*, *36*(3), 360–376. https://doi.org/10.1111/j.1475-5661.2011.00430.x

McFarlane, C. (2011e). The City as Assemblage: Dwelling and Urban Space. *Environment and Planning D: Society and Space*, *29*(4), 649–671. https://doi.org/10.1068/d4710

McFarlane, C. (2012a). From sanitation inequality to malevolent urbanism: The normalisation of suffering in Mumbai. *Geoforum*, *43*(6), 1287–1290. https://doi.org/10.1016/j.geoforum.2012.08.005

McFarlane, C. (2012b). Rethinking Informality: Politics, Crisis, and the City. *Planning Theory & Practice*, *13*(1), 89–108. https://doi.org/10.1080/14649357.2012.649951

McFarlane, C. (2012c). The Entrepreneurial Slum: Civil Society, Mobility and the Co-production of Urban Development. *Urban Studies*, *49*(13), 2795–2816. https://doi.org/10.1177/0042098012452460

McFarlane, C. (2016). The geographies of urban density: Topology, politics and the city. *Progress in Human Geography*, *40*(5), 629–648. https://doi.org/10.1177/0309132515608694

McFarlane, C., & Anderson, B. (2011). Thinking with assemblage: Thinking with assemblage. *Area*, *43*(2), 162–164. https://doi.org/10.1111/j.1475-4762.2011.01012.x

McFarlane, C., Desai, R., & Graham, S. (2014). Informal Urban Sanitation: Everyday Life, Poverty, and Comparison. *Annals of the Association of American Geographers*, *104*(5), 989–1011. https://doi.org/10.1080/00045608.2014.923718

Merrifield, A. (2014). *The new urban question*. London: PlutoPress.

Monmonier, M. S. (1996). *How to lie with maps* (2nd ed). Chicago: University of Chicago Press.

November, V., Camacho-Hübner, E., & Latour, B. (2010). Entering a Risky Territory: Space in the Age of Digital Navigation. *Environment and Planning D: Society and Space*, *28*(4), 581–599. https://doi.org/10.1068/d10409

Perkins, C. (2004). Cartography - cultures of mapping: power in practice. *Progress in Human Geography*, *28*(3), 381–391. https://doi.org/10.1191/0309132504ph504pr

Perkins, C. (2009). Performative and Embodied Mapping. In *International Encyclopedia of Human Geography* (pp. 126–132). Elsevier. https://doi.org/10.1016/B978-008044910-4.00024-9

Pickett, B. W., Faulkner, L. C., & Voss, J. L. (1975). Effect of season on some characteristics of stallion semen. *Journal of Reproduction and Fertility. Supplement*, (23), 25–28.

Pickles, J. (2004). *A history of spaces: cartographic reason, mapping, and the geo-coded world*. London ; New York: Routledge.

Rogers, A., & Vertovec, S. (Eds.). (1995). *The urban context: ethnicity, social networks, and situational analysis*. Oxford [England] ; Washington, D.C: Berg Publishers.

Scott, A. J., & Soja, E. W. (Eds.). (2005). *The city: Los Angeles and urban theory at the end of the twentieth century* (Nachdr.). Berkeley, Calif.: Univ. of California Press.

Scott, J. C. (2008). *Seeing like a state: how certain schemes to improve the human condition have failed* (Nachdr.). New Haven, Conn.: Yale Univ. Press.

Share, J. B. (1976a). Review of drug treatment for Down's syndrome persons. *American Journal of Mental Deficiency*, *80*(4), 388–393.

Share, J. B. (1976b). Review of drug treatment for Down's syndrome persons. *American Journal of Mental Deficiency*, *80*(4), 388–393.

Söderström, O. (1996). Paper Cities: Visual Thinking in Urban Planning. *Ecumene*, *3*(3), 249–281. https://doi.org/10.1177/147447409600300301

Söderström, O., Paasche, T., & Klauser, F. (2014). Smart cities as corporate storytelling. *City*, *18*(3), 307–320. https://doi.org/10.1080/13604813.2014.906716

Soja, E. W. (2000a). *Postmetropolis: critical studies of cities and regions*. Malden, MA: Blackwell Pub.

Soja, E. W. (2000b). *Postmetropolis: critical studies of cities and regions*. Malden, MA: Blackwell Pub.

Turnbull, D. (2005). *Masons, tricksters and cartographers: comparative studies in the sociology of scientific and indigenous knowledge*. London: Routledge. Retrieved from http://www.dawsonera.com/depp/reader/protected/external/AbstractView/S9780203304587

Turnbull, D., & Watson, H. (1993). *Maps are territories: science is an atlas: a portfolio of exhibits* (University of Chicago Press ed). Chicago: University of Chicago Press.

Ulrike Felt, Rayvon Fouché, Clark A. Miller, & Laurel Smith-Doerr (Eds.). (2017). *The handbook of science and technology studies* (Fourth edition). Cambridge, Massachusetts: The MIT Press.

Verran, H. (2002). A Postcolonial Moment in Science Studies: Alternative Firing Regimes of Environmental Scientists and Aboriginal Landowners. *Social Studies of Science*, *32*(5–6), 729–762. https://doi.org/10.1177/030631270203200506

Visvanathan, S. (2002). The future of science studies. *Futures*, *34*(1), 91–101. https://doi.org/10.1016/S0016-3287(01)00037-4

Walker, R. (2015). Building a better theory of the urban: A response to 'Towards a new epistemology of the urban?' *City*, *19*(2–3), 183–191. https://doi.org/10.1080/13604813.2015.1024073

Wendler, D., & Schmidt, W. (1975). [Teratological study of talinolol (Cordanum, 02-115)]. *Die Pharmazie*, *30*(10), 669–661.

Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, *109*(1), 121–136.

Wood, D., & Fels, J. (2011). Design on Signs/Myth and Meaning in Maps. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The Map Reader* (pp. 48–55). Chichester, UK: John Wiley & Sons, Ltd. https://doi.org/10.1002/9780470979587.ch7

Woolgar, S., & Cooper, G. (1999). Do Artefacts Have Ambivalence: Moses' Bridges, Winner's Bridges and other Urban Legends in S&TS. *Social Studies of Science*, *29*(3), 433–449. https://doi.org/10.1177/030631299029003005

Yapa, L. (2012). Cities for People, Not for Profit: Critical Urban Theory and the Right to the City edited by Neil Brenner, Peter Marcuse, and Margit Mayer. *Journal of Regional Science*, *52*(5), 897–899. https://doi.org/10.1111/jors.12006_13