



## **Re-enterprising the unplanned urban areas of Greater Cairo- a social innovation perspective**

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9 **Re-enterprising the unplanned urban areas of Greater Cairo- a social innovation**  
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11 **perspective**

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18 **Abstract**

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20 Social innovation addresses a type of networked cooperation where multiple stakeholders  
21 work towards shared outcomes for social transformation, within a collaborative ecosystem.

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23 The particular context of peripheral urban settlements around Cairo – some of them known  
24 as the ‘Forgotten Villages of Greater Cairo’ – necessitates a social innovation approach to  
25 sustainable development, given that such challenges are often present because of pressures  
26 exerted on already limited resources. In the paper we propose a transdisciplinary framework  
27 that builds on architecture, urban planning and entrepreneurship in order to look into  
28 responses which stem from water-based challenges in this area, placing a particular focus on  
29 women as entrepreneurial agents. The paper concludes with a blueprint of a strategic  
30 roadmap to be further investigated both academically as well as in practitioner-based inquiry  
31 with a view to generating potential future solutions.

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46 **Keywords:** unplanned urban areas, entrepreneurship, social innovation, women  
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## Introduction

This research aims to develop an innovative and comprehensive framework in order to address water-related challenges faced by communities located in urban settlements in the area of Greater Cairo. As Fabiola Giannotti (2018, p.127), the Director- General of CERN argued '*Today society faces many challenges: climate change/energy supply/food security and public health/to name a few. Collaborative science is an inescapable part of the solution to them*'. It is commonly accepted that such global challenges that border issues of resilience, community development, social equity as well as inclusive growth, call for a collaboration of disciplines that can create pathways towards robust solutions. The premise adopted in this research is that in addressing tangible real-world problems, no longer can individual disciplines have strong claims over their own direction and areas of knowledge production in isolation from what is happening in other disciplines or fields of inquiry. Solving the intractable problems that emerge within spaces such as rapidly developing urban settlements requires interdisciplinary, transdisciplinary and even post disciplinary approaches that bring together separate fields of knowledge, while crossing their boundaries (Salama, 2011).

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9 The aim of the study is to develop a framework for placed-based social innovation in the  
10 context of Greater Cairo, bringing together multiple perspectives in order to identify spatial,  
11 social and policy transformation with positive outcomes for peripheral communities. The  
12 research question concerns whether a holistic approach to spatial and enterprise planning can  
13 facilitate more sustainable growth; and whether a bottom-up participatory approach can  
14 inform more appropriate solutions to water challenges for female entrepreneurs. The  
15 conclusion presents the framework for further academic inquiry through a social innovation  
16 lens, with a view to greater transdisciplinarity between disciplines. This ‘networked  
17 cooperation’, is defined as a core aspect of social innovation in the contemporary body of  
18 knowledge, where multiple stakeholders work towards shared outcomes for social  
19 transformation, within a collaborative ecosystem is of relevance in our case (Horgan and  
20 Dimitrijević, 2018). Social innovation in the built environment occurs over phases - from  
21 network building, to framework formation leading to eventual solutions – be they  
22 architectural or otherwise (Horgan and Dimitrijević, 2021). Moulaert and MacCallum  
23 (2019:92) emphasise the diversity of relationships that provide the basis of a framework for  
24 action research on social innovation, and how *“plurality in the understanding of the  
25 dimensions, practices and processes of social innovation should always be part of the process  
26 leading to a workable analytical framework”*. This is an important principle, given that  
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9 “social innovation is highly contingent of its socio-political, spatial and temporal context”,  
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11 and that the “conditions for enabling transformative social innovation can be better  
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13 understood in light of lessons from the past” (Moulaert and MacCallum, 2019:92). The  
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15 particular context of peripheral urban settlements around Cairo – a number of them known  
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17 as the ‘Forgotten Villages of Greater Cairo’ – necessitates a social innovation approach to  
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19 sustainable development, particularly as such challenges are often present because of  
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21 pressures exerted on already limited resources. These settlements are adversely affected by  
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23 successive planning failures, laying bare the limits of established economic systems to  
24  
25 support equitable communities, and anthropogenic climate change - as identified through the  
26  
27 conducted research. Specifically, issues around the lack of adequate water infrastructure and  
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29 its negative impact on marginalised communities including their opportunities for social  
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31 mobility have significant overall impact. Although the research was conducted in 2018 and  
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33 2019, given how the more recent COVID-19 crisis has brought home the importance of clean  
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35 water and sanitation services for vulnerable communities, this paper is timely in proposing a  
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37 blueprint for a strategic roadmap to address ‘wicked societal challenges’.  
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### **Setting the scene: Urban Settlements in Greater Cairo and their planning challenges**

Egypt has a notable history of planning shortcomings and development failures since the middle of the twentieth century, many due to ill-considered strategies for new settlements outside the metropolitan conurbation. Many of the new cities built in the hinterland of the capital are not fit for purpose, catering from middle to high-income groups who are reluctant to relocate from Cairo's urban centres, despite of the earlier attempts (1970s-1980s) to develop a new master plan for the city, which would direct urban growth to towns towards the east as well as west parts of it (Khalifa, 2015). The 1970s 'New Towns' plan to relocate the residents from agricultural lands to the desert failed due to affordability, remoteness and lack of essential services, and in the 1980s the government shifted the perspective towards the development of 'New Towns' while providing housing environments that adopt 'site-and-services' and 'self-help' concepts, which were still unaffordable (Sutton & Fahmi, 2001). In the 1990s, the government began to pay attention to security and social infrastructure, and the need for social resilience within communities. A national survey was conducted and revealed that there were 1221 informal areas, 1201 are upgradable and 20 are to be removed or replaced. The intervention program involved two stages:

- (1) Informal Settlement Development – providing basic services and infrastructure
- (2) Belting programme- limiting the growth of informal settlements.

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9 Studies into these initiatives by Khalifa (2015) noted that the whole programme suffered  
10 from a lack of community participation, and engagement with key stakeholders. In the first  
11 decade of the 21<sup>st</sup> century, pressure began to build on the government to respond to enduring  
12 spatial equalities and address imbalanced development strategy. In 2008 for example, the  
13 ISDF (Informal Settlements Development Fund) was established, adopting a strategy to  
14 differentiate between unsafe areas and unplanned areas; as unplanned areas were defined  
15 those that are not subject to detailed plans, land subdivision plans nor compliant with  
16 planning and building laws and regulations. Unsafe areas are viewed as posing risk to life,  
17 health and tenure or having poor housing or located in hazardous sites that pose risk to health.  
18 The general policy of ISDF advocates in situ upgrading, without relocation of people in order  
19 to preserve social networks and to maintain their source of income (Khalifa, 2011).  
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34 Nuanced approaches to planning for informal settlements encourage making connections  
35 among previously siloed or separated functions of government and society. The underlying  
36 reasons that contribute to challenges are deeply related and cannot be viewed in isolation.  
37 Discussion on informal settlements in Egypt in the context of this study is centred on a) basic  
38 reasons, b) key characteristics, and c) aspects of interventions.  
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46 Informal settlements have emerged and developed into a phenomenon for various reasons  
47 that can be clustered under two wide categories:  
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9 *(a) Population Growth:* Growth from natural increase and high birth rates as well as a  
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11 result of rural-urban migration (El-Batran & Arandel, 1998) caused an increase of 30  
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13 percent in Cairo during the last century.  
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16 *(b) Housing Policies* (Khalifa, 2015):  
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18 Following earlier socialist policies and a prior wave of investment in the public housing  
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20 sector, Sadat's 'Open-Door' economic policy in the early 1970s attracted private and  
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22 foreign investments to the country which resulted in a general norm that rendered the  
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24 state responsible for low-income housing, and the private sector responsible for supply  
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26 for higher-income groups. This co-incided with the policy of New Towns to relocate  
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28 residents from agricultural lands to desert areas and the provision of housing based on  
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30 site-and-services.  
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34 The key characteristics of informal settlements in Egypt can be discussed in physical and  
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36 socio-economic terms. In terms of the former, informal settlements are of incremental nature  
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38 with construction and urban elements being determined via existing street patterns, buildings,  
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40 topography and natural and man-made features, but lacking key facilities, amenities, services  
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42 and infrastructure (Arandel & El-Batran, 1997). Informality, on the other hand can be dually  
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44 defined: informal areas that grew on public land -predominantly desert, and informal areas  
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46 that grew on private land- predominantly agricultural land (Khalil, 2010) - although Egyptian  
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9 law does not make a differentiation, seeing both as unplanned areas (a recent UN Habitat  
10 study aims to clarify each other's characteristics). The informal settlements on agricultural  
11 land are located on the urban periphery and are of a generally better quality, while the ones  
12 on desert lands can range from low- quality one storey residential buildings to better quality  
13 6-8 story buildings; also, there is a large stock of vacant buildings, although the density of  
14 informal settlements is double the density of Cairo as a whole, with older informal areas  
15 being more densely populated (Denis & Sejourne, 2002), and more highly so, within the  
16 informalities of Greater Cairo Region (Khalil & Gammaz, 2019). Physically, the structure of  
17 the settlements shapes according to the type and strength of social relations between various  
18 groups and families. Members of the community cooperate to provide public services such  
19 as waste collection, street lighting, street cleaning, and public landscaping (Eldefrawi, 2013).  
20 Social norms, including the need for privacy, isolation or integration, contribute to the  
21 shaping of the urban fabric. The residential streets are narrow so as to restrict strangers and  
22 control pedestrian traffic but allow to for multiple activities like: extended home activities,  
23 extended work space to the street, extended cafés to sidewalk or pedestrian pathways,  
24 extended ceremony hall and extended playground. Also, the plot and building pattern in the  
25 settlements are created with a compact pattern and an order that is respecting the proximity  
26 of services, work and home, with the distances between them are walkable (Eldefrawi, 2013).  
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9 It is worth noting that informal areas are developed without the intervention of technical  
10 planning expertise, hence they manifest spatially the actual needs of grass root development  
11 in contrast to formal theory- based planning advocated by the planning profession in other  
12 parts of the city (Khalil & Gammaz, 2019).  
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20 Development strategies that take a bottom-up approach inherently necessitate the bringing  
21 together of a diverse set of disciplines and knowledge – to inform a holistic evidence base -  
22 working towards shared outcomes for communities in a given location. In general, this can  
23 be considered as part of a social innovation methodology, informed by place-making  
24 principles, where the tacit knowledge of communities, and their inherent resources, are  
25 considered important assets with which to shape development proposals (Horgan, 2020).  
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34 Promoting knowledge exchange – and iterative collaboration - between disciplines requires  
35 the translation of data and concepts, on issues such as informality, usage and behavioural  
36 patterns and other dynamics that can provide a fuller understanding of the root causes of  
37 spatial inequalities. Interdisciplinary research of this type - uncommon in architectural  
38 research, and peripheral in the study of business and entrepreneurship – requires a composite  
39 framework, informed by innovative uses of methodology.  
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### **Perspectives from the participating disciplines: a composite framework**

One of the bigger challenges in terms of interdisciplinary research is defining the space of inquiry between macro disciplines ('radical interdisciplinarity' according to Winskel, 2018); related challenges can include '...a meeting of physical science's positivist laws and determinisms and social science's interpretivist hermeneutics...problem definition; data, evidence and proof; research methods; unit and scale of analysis; the role of non-academic stakeholders and funding and reward structures' (p 78). In creating a framework for our research, we aimed to go beyond the challenge of 'subordination-service exchange....when social science plays a subservient or 'gap-filling' role' (Winskel, p.79). Whilst the debate about the efficiency and effectiveness of interdisciplinary approach in identifying and addressing complex challenges is an on-going one, an interest is increasingly expressed in terms of 'transdisciplinarity' as an approach, which aims to integrate from the conception phase of the inquiry, non-academic stakeholders, via 'knowledge production and exchange' (Salama, 2011, 2019; Winskel, 2018). For the purposes of the project on which the present paper is based, we followed a transdisciplinary approach, blending perspectives from urban planning with focus on water challenges, social innovation, architecture and women-led entrepreneurship.

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9 Entrepreneurship for this particular project takes into consideration ways in which  
10 members of the community proactively engage themselves in coming up with *enterprising*  
11 *solutions* which not only aim to resolve the immediate issues that they are facing, but also to  
12 generate wealth for them, as well as for the community in general. This is a particular form  
13 of social entrepreneurship which has its roots in community-based understanding of common  
14 assets and in ways in which their well-being can influence the well-being of communities too  
15 (Cohen and Munoz 2016). Water is, in that sense, a community asset and ways in which its  
16 condition and provision is influencing the community dynamics (production/food/sanitation)  
17 plays an important role in how its inter-related challenges are perceived and possibly  
18 addressed. In addition to that, there are ways in which entrepreneurship is developed despite  
19 the water-based challenges faced by such communities. Access to safe water is of utmost  
20 importance to the quality of life of women and children, and this challenge is exacerbated in  
21 the urban settings where most of the poor reside (Anderson et al, 2016). Women, in particular,  
22 could utilize the time devoted to water sanitation and wastewater management in other  
23 productive activities; in this context, the quality of water could be impeding the general  
24 quality of life and the quality and outcome of women's business and entrepreneurial  
25 activities. Additionally, we also scoped ways in which entrepreneurial practices in other  
26 sectors (non-water related), inspire and affect these communities- and in particular, the  
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9 women entrepreneurs in them, whilst also supporting the expansion of a mindset which is  
10 focused on addressing a social challenge as an entrepreneurial opportunity.  
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14 The second perspective forming the inter-disciplinary framework comes from  
15 Architecture and Urban Planning and is focusing on the assessment and re-conceptualization  
16 of space as context. Lefebvre's (1968;1974) work, in particular, which is increasingly  
17 informing both Entrepreneurship as well as Architecture because of the importance it places  
18 on society and the urban space, allows for the creation of novel inter- disciplinary and multi-  
19 layered approaches to the study of the identified challenges in a context such as the one that  
20 the project focused on. Lefebvre's (1968;1974) key tenets – to guarantee citizens' rights to  
21 access dignified housing and employment – are echoed in the United Nations Sustainable  
22 Development Goals, in particular SDG 11- a commitment to make cities and human  
23 settlements inclusive, safe, resilient and sustainable (United Nations SDGs). For instance,  
24 Lefebvre's (1968;1974) tri-partite framework facilitates analysis of the imagined/conceived  
25 in studying stakeholders' settlement-relevant interventions, the measured / perceived in terms  
26 of economic and entrepreneurial practice, and the experienced / lived in terms of the socio-  
27 spatial context (Salama et al., 2016). Within this particular framework, it would be interesting  
28 to observe ways in which the space of solutions is created and policy /practice is developed.  
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30 As a methodological implication, the community approach and methods of participation in  
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9 scoping gain significance, as policy interventions can be framed via partial viewpoints of  
10 perception, and can be divided via the agenda of different stakeholders. This embedded  
11 approach helps researchers to understand the social dynamics at play in urban settlements  
12 and to effectively align agendas around mutually desired outcomes.  
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18 According to Lefebvre (1991) "*the spatial practice of a society is revealed through*  
19 *the deciphering of space. [...] The specific spatial competence and performance of every*  
20 *society member can only be evaluated empirically. [...] spatial practice consists in a*  
21 *projection onto a (spatial) field of all aspects, elements and moments of social practice. [...]*  
22 *Like all social practice, spatial practice is lived directly before it is conceptualized; but the*  
23 *speculative primacy of the conceived over the lived causes practice to disappear along with*  
24 *life, and so does very little justice to the 'unconscious' level of lived experience per*  
25 *se (Lefebvre 1991, p.38, p.8 & p.34)".*  
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43 Thus, spatial practice and social practice inevitably impact one another. In other words, these  
44 practices operate within a particular political process and, in turn, as part of a planning  
45 culture. Therefore, understanding the relationships between both spatial and the social  
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9 practices becomes essential in order to learn more on the production of urban spaces in the  
10 different contexts, such as the ones referred to in this paper. This is particularly important, as  
11 according to Kevin Lynch (1981), '*sense is the degree to which the settlement can be clearly*  
12 *perceived and mentally differentiated and structured in time and space by its residents and*  
13 *the degree to which that mental structure connects with their value and concepts – the match*  
14 *between environment, our sensory and mental capabilities, and our cultural constructs*  
15 *(Lynch, p.118)'*

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25 A multitude of diverse attributes is required for effective urban performance at  
26 various scales, ranging from the immediate context of both planned and unplanned  
27 developments. Following Lefebvre's postulation, these qualities can be framed under a cycle  
28 of three main symbiotic pillars: the *imagined*, the *measured*, and the *experienced*, which  
29 contribute to the development of insights that elucidate various parameters for describing and  
30 exploring urban performance in unplanned developments. These three pillars stem from  
31 Lefebvrian arguments and Lefebvre's theory on the production of space, which postulates a  
32 triadic relationship of three different but related types of spaces: the conceived (imagined),  
33 the perceived (measured) and the lived (experienced). The current body of knowledge on  
34 Lefebvre's work suggests that the 'conceived space' is abstract and tactical and where  
35 authority functions, the 'perceived space' is a pragmatic, physical space encompassing flows  
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9 of investment, workforce, and information- and that this where the conceived and lived  
10 spaces are construed. In a recent contribution and following their earlier work, Salama and  
11 Grierson (2019) suggest that the 'lived space' is the most subjective space, involving the  
12 actual experience of individuals that is performed in the 'perceived space' and as a result of  
13 the 'conceived space'.  
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20 In order to work towards shared goals for boosting urban sustainability that addresses  
21 prevailing inequalities, social innovation in the built environment is required. Increasingly,  
22 this depends on the developing holistic policy which can facilitate a roadmap that relies on  
23 *agile development* methodologies which encourage deep community engagement (eg:  
24 Aravena and Mehrotra's *ephemeral urbanism* (as found in Dimitrijević, 2019).  
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### 34 **Water challenges in urban settlements**

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36 Egypt faces a predicament of pollution of water resources by industrial wastewater,  
37 agricultural drainage water as well as municipal wastewater – all presenting threats to the  
38 health of its citizens especially in the informal areas. Related challenges require the  
39 mobilization and management of all resources in an integrated manner (Abdel Meguid,  
40 2017); this is particularly the case as the amount of accessible water resources is fixed, while  
41 water demands are growing as the population continues to grow. Water quality problems in  
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9 Egypt vary according to the location and depend on factors such as water uses, population  
10 densities, consumptions per household, sanitation systems, industrial discharges, and  
11 agricultural runoff. Previous studies have shown the effect of deteriorated old water  
12 infrastructure on the quality of potable water on the household level within informal areas in  
13 Greater Cairo Region (Attia & Khalil, 2015).  
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### 27 **Women entrepreneurs in informal settlements and links to water as part of the context** 28 **and entrepreneurial opportunity** 29 30

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32 Understanding informal settlements as an entrepreneurial context has its own challenges, as  
33 their conditions are significantly different from more commonly acceptable ecosystems of  
34 entrepreneurship, where institutional norms, systems and actors allow for entrepreneurial  
35 activities to be developed based on the discovery or creation of an opportunity  
36 (Audretsch and Belitski, 2017).  
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43 From GEM data (Allen et al., 2007) it is suggested that female entrepreneurial activity is  
44 considerably greater in low- and middle-income economies in comparison to how much of it  
45 has been documented till now. Context, as a subfield of study within the discipline of  
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9 entrepreneurship has been given extensive reviews in relevant literature- and it is a well-  
10 established concept in the study of architecture and urban settlements; it can be defined as  
11 “*circumstances, conditions, situations, or environments that are external to the respective*  
12 *phenomenon and enable or constrain it*” (Welter, 2011, p. 167). Context can be  
13 encompassing of culture, individual ethnicity, social, economic, and political aspects  
14 involved in entrepreneurial activities (Mitchell et al., 2002a), that produce both attitude as  
15 well as entrepreneurial behaviour differences (Shane 1994).  
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25 Research has indicated that individuals can be imprinted through a variety of sources,  
26 such as through economic conditions, institutional conditions, family members, or other  
27 individuals (Mathias et al, 2015). Exploring how the imprinting process influences  
28 marginalized women entrepreneurs in such deprived areas is vital to understanding their  
29 selection of current and potential future opportunities. Since the government is not equipped  
30 to solve all of the country’s problems, entrepreneurial agents would be looking towards the  
31 development of relevant forms of social entrepreneurship, which can address economic  
32 growth, as well as the responses to social needs and social exclusion (as indicated by  
33 Nicolopoulou, et al, 2014).  
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45 Recently, Egyptian youth have established, and are leading, several social enterprises  
46 with a yet untapped potential to contribute to Egypt’s development (Abdou et al., 2010)  
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9 Several such social enterprises work mainly with women in rural areas and distressed  
10 communities with the aim of empowering them. Also, NGOs with a social enterprise element  
11 are focusing on empowerment instead of providing financial aid- for example programmes  
12 in Upper and rural Egypt are training women in embroidery and other handicrafts. Usually,  
13 the women work either at their homes or in training centres and receive payment per item  
14 produced, thus, over time, women involved in these initiatives are motivated to set up their  
15 own businesses, although their effectiveness in terms of the impact on women's income,  
16 empowerment and capacity building are always the topic of further investigation (Guerin and  
17 Marius-Gnanou, 2005). Women face serious challenges in terms of participation in economic  
18 life in Egypt in general. El Mahdi (2006) reports that female owned enterprises in the country  
19 account for a larger percentage of enterprises in rural communities than in urban areas, where  
20 women face additional severe problems than in other regions (IFC 2005). Egyptian women,  
21 mainly living in the lower socio-economic groups, are the main breadwinners for their  
22 households, if illiterate, divorced or widowed, are in need to generate a second income to  
23 assist with the everyday ongoing expenditures, although according to The UNDP Egypt  
24 Human Development Report (2005) they operate entrepreneurially in conditions of  
25 informality. Drawing the bigger picture with regards to these challenges, it is relatively easy  
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9 to understand how such contexts equally present challenges in terms of the infrastructure and  
10 access to resources.  
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14 Filtered or purified water is a dream for the women in the Greater Cairo unplanned areas,  
15 especially with the increase in water issues regarding contamination and pollution.  
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17 Households that obtained water filters have a long process of instalment repaying, although  
18 they are already in need of an upgrade to a 7-stage filter instead of a 3-stage one, currently in  
19 place, although there are serious challenges in obtaining those.  
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27 Ventures that focus on the production of food suffer from lack of hygienic conditions in terms  
28 of water access and use, as well as from potential clients' complaints. Such potential risks  
29 tend to ruin the possibilities to develop entrepreneurial activities, whilst the overarching  
30 expectation is for the government to step in and resolve infrastructural and access issues,  
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### 38 **Methodology: depth, participation and engagement in word and images**

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40 The research process followed was *participatory and ethnographic*, and it involved, apart  
41 from 12 *site interviews*, engagement via a visuals-based exhibition focusing on materials  
42 from the studied community, during an outreach and engagement event in one of the  
43 academic institutions involved in the project.  
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9 The ethnographic approach allowed the researcher to obtain an insider view and understand  
10 the social experiences of the participants by exploring them in-depth and to collect rich  
11 detailed information (Bryman 2008). A purposive sampling method was used to select  
12 women to participate in the study. Purposive sampling allowed the researchers the freedom  
13 to choose the respondents (Saunders *et al.*, 2009:237). One of the researchers had former  
14 knowledge about women who are affected by water issues over and above about the pool of  
15 respondents. Moreover, she had conducted parallel studies in a similar context which allowed  
16 her to meet a substantial number of female entrepreneurs embedded in unplanned areas in  
17 Egypt.

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29 The engagement event focused on global outreach and projects with impact; the method used  
30 for the engagement with the visual materials was based on principles of rapid brainstorming.  
31 Rapid responses were sought from participants on the basis of two core topics: ‘what  
32 innovation/social innovation solutions could be applied in order to tackle depicted  
33 challenges’ and ‘what are the entrepreneurial responses that could develop in order to tackle  
34 the depicted challenges. Answers were collated in flipcharts and were further elaborated on,  
35 in conversation, in order to generate potential future strategies in related communities. The  
36 typology developed and presented at the end of the paper merits further examination in future  
37 research as to the suitability of such solutions.

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9 In terms of the first stage of the project, identification of stakeholders took place as  
10 well as the mapping of their key problems and opportunities, including the definition of the  
11 key water management issues in the areas of interest to the different stakeholders involved.  
12  
13 A typology of the water management issues in comparison to the area classification was  
14 subsequently outlined (Table 1) as a preliminary output of the project activities. According  
15 to Dana and Dana (2005), an inquiry based on inductive qualitative methodologies is a  
16 prevailing paradigm in sociological and anthropological research; such inquiry would be  
17 based upon thick descriptions of agents and their interactions with context (Geertz, 1973).  
18 This approach would respond to challenges identified by Gaddefors and Anderson (2017),  
19 who argue that the current methodological individualism of the prevailing paradigms, does  
20 not leave explanatory room for the role of social context; Patton (1982; p.10) argues that  
21 *“The methodological mandate to be contextually sensitive, inductive, and naturalistic means*  
22 *that researchers must get close to the phenomenon under study. The institutional researcher*  
23 *who uses qualitative methods attempts to understand the setting under study through direct*  
24 *personal contact ... through physical proximity for a period of time and through the*  
25 *development of closeness.”*  
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45 Based on the pre- adopted pro-community approach in water resource management  
46 and the participation of one of the most vulnerable segments of the community- i.e. women-  
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9 stakeholder discussions were held, which can have the potential to ensure fuller participation  
10 of local people in development issues and impactful changes in marginalised communities,  
11 at a later stage.  
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16 IMAGE 1 HERE

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### 23 **Visual Ethnography**

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25 The project engaged with a particular branch of ethnography- visual ethnography (Lenette  
26 and Boady, 2013), which was done on the basis of collection of several photographs of the  
27 surroundings. Ethnography and visual methods produce richer and more contextualized data.  
28  
29 Pink (2012: 6) highlights that visual methods are a ‘field for interdisciplinary scholarship’  
30 which expands and enhances ‘the production of knowledge and ways of knowing’ (Pink,  
31 2006: 53). Lenette & Boddy (2013) assert that such methods allow nuanced discoveries of  
32 complex themes, permitting better forms of data to emerge. The strength of images is their  
33 richness in context and the amount of specific information they can transfer (Flick, 2007). In  
34 conducting a visual ethnography, we were able to unlock and ‘to understand specific themes  
35 within participants’ (Lenette and Boady, 2013; p 72), everyday realities as well as gender  
36 and water issues. It also allowed us to understand the hidden layers in this marginalised  
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9 context, following Steyaert (2004, p.10) who outlines that '*...the everyday is the scene where*  
10 *social change and individual creativity take place as a slow result of constant activity.*  
11 *Innovation is not the Great Renewal but the daily effort of thousands of small steps which -*  
12 *after all- make a difference*'. These 'small steps' mentioned by Steyaert (2004) were recorded  
13 through the visuals which later helped in creating a rich narrative of the entrepreneurial  
14 endeavours pursued in these communities.  
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### 25 **Analytical method**

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27 We gathered the photos into different themes and counted how many themes appeared across  
28 all of the collected photos (Thomas, 2009). Thematic analysis was used to analyse the  
29 findings. This included classifying the various themes that developed from the various data  
30 collected (Bryman 2008, Harding, 2013). Thematic analysis is "*a method of identifying,*  
31 *analysing and reporting patterns within the data*" (Braun & Clarke, 2006, p. 77). It was also  
32 utilised to analyse the qualitative data gathered during the site interviews.  
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41 The process of analysis started with reading and familiarizing with our data and taking initial  
42 notes. We went through a thorough overview of all the data we collected before we start  
43 analysing to get a general understanding of what is going on (Creswell 2003). The next step  
44 was narrowing the data to units of meaning through coding each of the themes (Bryman  
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9 2008). Coding reduced the data into workable chunks. Afterwards, we identified patterns  
10 among the codes, and came up with the themes. Later we made sure that our identified themes  
11 are accurate representations of the different collected data and we named our themes (Figure  
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16 2). Lastly, we wrote our data analysis.  
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### 20 **Outcomes from the experts' stakeholder engagement workshop**

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22 As outlined above, an expert workshop, took place during an engagement university-focused  
23 event related to impactful global projects, where we had the opportunity to engage with an  
24 academic community specialised in social innovation-driven, technological, governance and  
25 management solutions; the interactions, which, as described above, took place via the method  
26 of 'rapid brainstorming' with a focus on innovation and entrepreneurship, highlighted the  
27 following potential interventions:  
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#### 39 ***Entrepreneurship- driven solutions:***

- 41 • Capacity building in terms of specific trades or schemes
- 42 • Water couriers ('just drink'): small fee to transport water /distribute to communities  
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44 (business opportunity)  
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- Water point committees and the development of partnerships with established institutional stakeholders like NGOs, Banks and others
- Introduce digital (e-payments) to boost savings and safeguard funds/sales
- Product differentiation (clean/bottled water- different colour per village) to prove purity
- Community groups to share water saving ideas and good practice
- Explore the set-up of water user associations
- Set up self-help child care to facilitate the process of enterprising in water for women
- Raise awareness about global dimensions of the problem and highlight set of barriers in the context

***Innovation- driven solutions:***

- Permaculture
- Water tanks for intermittent supply (between communities)-sharing knowledge with best cases from Africa
- Rainwater harvesting systems in homes
- Help develop smartphone apps to connect and share; reporting via GPS
- Implement simple testing kits to identify problems
- Use textile/knitting skills to create water filters

- Create a thread impregnated with water purifiers
  - Implement behavioural change by a campaign to make water collection management a male activity
  - Communication and network development to share local learning
- Matching such solutions to the requirements of the specific community studied, or to comparable communities was only done at conceptual level, as we did not seek to affirm with participants their suitability and implementation potential, however this matching merits further empirical investigation and can be the basis of a future project as well.

### **Social innovation as a critical component of a strategy to create a roadmap for future proofing development in informal settlements- insights from a ‘lived’, ‘perceived’ and ‘conceived’ perspective**

Lefebvre’s (1968;1974) tri-partite framework facilitates analysis of the imagined/conceived in studying the role of stakeholders in settlement interventions, the measured / perceived in terms of economic and entrepreneurial practice, and the experienced / lived in terms of the socio-spatial context. Moreover, as Rose (1993) argues, being defined as a woman might entail feeling confined and constrained by space, the gendered practices

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9 and power structures of everyday life constrain women's space and thus produce and  
10 reproduce space that is gendered (Rose, 1993).

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13 Within this particular framework, a space of solutions can be created and policy /practice can  
14 be developed.  
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18 At high-level, social innovation responds to an unmet social need – which necessitates  
19 the coming together of multiple actors in concert to propose and test solutions (Moulaert and  
20 MacCallum, 2019; Mulgan, 2019). In the design of urban settlements, interdisciplinary - and  
21 transdisciplinary - collaboration is promoted in the UN New Urban Agenda, and echoed at  
22 the ground level in the smart city strategies of metropolitan conurbations around the world.  
23 However, genuine, holistic social innovation that tackles the root causes of spatial inequality  
24 is dependent on robust governance, ownership and participation among stakeholders (Horgan  
25 and Dimitrijević, 2019). In the context of Egypt, social innovation offers pathways for local  
26 communities to devise tailor-made responsive solutions that make best use of their exiting  
27 resource and capacities. Access to water remains a persistent challenge in informal  
28 settlements in Egypt, having a disproportionately negative impact on particular groups such  
29 as women from low-income backgrounds. Most forms of settlements are faced with water  
30 challenges; in the particular areas of unplanned urban settlements in Greater Cairo, these  
31 challenges have to do with stagnant waters from nearby informal production units, as well as  
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9 the lack of proper infrastructure which pollutes water on the way to households. The water  
10 challenges in these areas are defined as ‘negative sanitation systems’ which means ‘directly  
11 discharging highly polluted sewage into water irrigation water streams, canals and drains or  
12 on-site facilities such as cesspools and trenches’ (Azeem, 2014, p. 9). We have observed  
13 small-scale household-based solutions being developed in order to address the challenges-  
14 small-scale ingenuity-driven ones, such as adding cotton under the water taps in order to filter  
15 the water. Indeed, as one of the stakeholders interviewed told us, ‘*there is a level of ingenuity*  
16 *in Egyptians, there is always a drive to recycle or to upcycle- nothing gets wasted here*’.  
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27 Nonetheless, there seems to be a concurrent disconnect between the capacity to  
28 develop innovation/innovative solutions and the capacity to effectively deploy them in  
29 settlements, at the community level, outside of each household; yet, as one of the  
30 interviewees confirmed, there is a very good chance that once a solution is adopted and  
31 promoted by a key leadership figure, this solution can be taken much further in terms of  
32 adoption by the community and subsequent scale-up. This can be viewed as social innovation  
33 through a process of place-making (Horgan, 2020), and could include engaging potential  
34 partners that can bring solutions to commercial fruition.  
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45 From a normative, gender- informed perspective, Ibrahim Huber (2018) notes that  
46 the spaces of *males* versus *females* in terms of water management in settlements are quite  
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9 different, in that the management aspect of both the water as well as the land is typically a  
10 male domain, whilst the quality of water, particularly pertaining to caring for health of the  
11 family, together with the management of solid waste is predominantly considered a female  
12 responsibility. This element of ownership of the solutions to water is pervasive in terms of  
13 envisaged participatory approaches to the management of water and its solutions. Azeem  
14 (2014) for example, differentiates between approaches to resolving water challenges, which  
15 are seen as purely technical (eg: centralization in one facility of wastewater for treatment)  
16 versus socio-technical, which allows users to also participate in its management and  
17 ownership, thus de-centralising towards the people involved.  
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30 Within the framework mentioned above, it would be really challenging for one  
31 technological or managerial adjustment, particularly if driven from a centralized perspective,  
32 to create systemic, scalable change. The challenges would rather be addressed from within  
33 an ‘innovation ecosystem’ of water in and around the settlement communities- and, in this  
34 particular case, highlighting the role of women in it. The response requires a holistic approach  
35 to developing solutions that allows for the participation of multiple disciplines and  
36 viewpoints.  
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46 In the process of conducting our ethnographic research, we observed that the residents  
47 of the deprived area studied, were eager to participate in any form of collaboration, regardless  
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9 at an individual or a collective level, which corresponds to Ayob et al.'s (2016) framework  
10 on social innovation pathways. The participants disclosed that a positive societal impact and  
11 improving the quality of life for their whole community is what they were looking for.  
12  
13 Moreover, one interviewee stressed that women entrepreneurs and SME owners are in dire  
14 need of professional training in order to be able to address managerial and finance –focused  
15 issues. Bearing on the fact that several enterprises are not operating within a legalized  
16 framework however, in effect impedes the entrepreneurs from accessing the expertise they  
17 need.  
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21 For that reason, a general mind-set issue around legality and legitimacy should be tackled  
22 if innovative solutions driven from within the community are to be fully adopted and scaled  
23 up. That mind-set shift also bears on the available funding and the perceived notion of  
24 governmental top-down support. The other disconnect in a socially-targeted innovation  
25 ecosystem is the lack of a culture of innovation- the drive to experiment, and to do things  
26 differently, subsequently moving from a prototype to scale; in other words, systematizing  
27 and legitimizing the ingenuity and experimentation with 'rough solutions' which might be  
28 taking place at the level of the household, by moving it into the community. Finally,  
29 'unlocking' women from their more traditional roles in the cycle of water issues, and  
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9 facilitating them to have a say in management aspects of related water-focused processes  
10 could be one of the ways forward.  
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### 13 14 15 16 17 18 **Elements of a blueprint for a strategic roadmap based on social innovation** 19

20 Identified challenges may be addressed with some interim solutions, which could form a  
21 central spine of a strategic roadmap in order to forge ways forward:  
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25 • Developing and fostering a culture of innovation in the local ecosystems through  
26 community programmes with local outreach points, via a dialogue process with  
27 stakeholders and also women inhabitants of the settlements was an important insight  
28 from our study  
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- 31  
32 • Scaling out successful prototypes which have been implemented successfully by  
33 organisations such as that of BLACD, Egypt could be helpful (the organization has  
34 been effectively implementing a sustainable development – focused model for clean  
35 water and sanitary latrines for more than 6,000 people in 12 villages and is scaling  
36 out further). An additional step in this direction would be to support the creation of  
37 self-governed learning networks/hubs operating with a focus to exchange knowledge  
38 and expertise on the basis of best practice and growth  
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- Further investigation and learning would have to be afforded in order to understand ways in which water- focused innovation (in terms of technical or socio-technical systems) is developed in Egypt or it is adapted from international models. On the basis of better understanding the nuances of the innovation/technology transfer process, entrepreneurial incentives could be created in order to support production or adaptation with a scope to further scale out, via the creation of specifically designed programmes to that end.
- The creation of ‘Living labs’ and similar participatory platforms for social innovation in designated areas could also be developed; these could comprise a mixture of digital and physical spaces and platforms, combined into a rich and robust ecosystem for multi-stakeholder collaboration.

In order to sketch ways forward with the application of such a roadmap, we have compiled a composite typology which identifies the different types of unplanned urban areas co-related to the different water challenges they are faced with.

**TABLE 1 HERE**

This typology can be more widely applicable to a number of unplanned areas, such as:

- Imbaba which is located west of the Nile and northwest of and near Gezira Island and downtown Cairo. A research by the Higher Institute of Social Services (HISS, 1989) in Imbaba, an informal zone located on agricultural land, extends on 3000 Feddan approximately, with a population that must have exceeded one million, and with abundant service activities and workshops. Historically, Imbaba was considered to be a formally planned area with bulky amounts of homogenous public housing from the 1960's surrounded by agricultural privately owned land. After the independence in 1952, mass housing for low-income workers added entire district-scale estates to the city, such as in Imbaba.
- The 1992 earthquake in Egypt was a major cause of migration and mobility within the Greater Cairo Region. The earthquake was 5.8 R strong and its center was approximately 35 kilometres south of the center of the Greater Cairo Region. Masaken El-Zelzal (literally means earthquake) is located on Mokattam Hill. People were relocated to government-provided low-cost housing there after the 1992 earthquake. Most of the people there had previously lived in other poor areas of Cairo, including informal settlements. The area is remote and poorly networked with the rest of Cairo, with very basic infrastructure for sewage, water and electricity.

- Al-Darb al-Ahmar, which is considered a historical area in Cairo, signifies the traditional urban fabric of medieval Islamic Cairo, yet the area is characterised by a condensed population and lack of social services (Aslan, 2006). Al Darb al-Ahmar households are among the poorest in Egypt, as people have to survive on less than the equivalent of one dollar per day.
- The City of the Dead aka Cairo Necropolis is vast Islamic-era cemeteries on the edges of old historic Cairo. It extends to the north and to the south of the Cairo Citadel, covering an area roughly 4 miles long. Its inhabitants' mainly illegally occupy the tombs or carry out a task concerning the funerals as being gravediggers; others find occasional jobs out of the place in small shops. Cairo's 'Cities of the Dead' have entered the Third World settlement literature as a unique kind of squatter settlement.

Finally, concrete interventions and support could take place in terms of women entrepreneurs in order to support their dual mission of contributing to economic growth, whilst adding value towards social and community outcomes. These could include:

- Implementation of mentoring systems since researchers have highlighted the significance of imprinting to individuals and potential entrepreneurs through early mentoring (Azoulay et al., 2011).

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- Women’s active participation in water and sanitation projects can be indispensable in any water related project because of their key roles in the maintenance of water, sanitation and hygiene at their own, domestic level.
- Establishing cluster communities in underprivileged locations offering opportunities for female entrepreneurs to benefit from shared facilities and experience (according to insights acquired from comparable cases presented at ENID annual conference, 2019).
- Understanding and strengthening of the presence of women entrepreneurs in the different marginalized regions across Egypt; this could entail in-depth field work and tailored programs in accordance.
- Incorporating gender considerations into new projects by aid agencies, NGOs or government- an essential component to reinforce gender-mainstreaming initiatives.

We are proposing a combination of the elements derived from the typology, blending insights from all participating disciplines through the select theoretical framework (table 2). Our proposition is open to further academic and practice-based discussion and investigation.

**TABLE 2 HERE**

## Concluding reflections and way forward

Social innovation can promote agile processes to prototyping new public services, involving multiple sectors as well as stakeholders through open ecosystems. For urban settlements undergoing rapid expansion, social innovation can help both communities and governments to build resilience in the face of resource gaps – often making use of advancements in technology and improvements from other disciplines to support social transformation – the process itself becoming a catalyst for building community capacities from the bottom-up (Horgan and Dimitrijević, 2019). For the unplanned urban areas around Greater Cairo, input from different knowledge areas can offer valuable contributions- for example, in terms of our project and the study that we report on in this paper, the contributing areas included architecture and urban planning, as well as women-led entrepreneurship targeting economic growth, social and community impacts. As the world becomes increasingly urban, the drain on collective assets produces a need for a holistic evidence base to inform new models for urban governance- participation from the grass-roots can allow community ownership over development strategies. This could be key to providing for sustainable communities and managing inclusive and equitable growth in rapidly growing settlements.

The framework we are proposing in the present article, acknowledges these dynamics and seeks to learn from other cases and disciplines, building, thus, the potential in terms of

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9 scaling up and scaling out of solutions which might be identified or developed in the context.  
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11 Subsequent research could look at barriers to place-based social innovation from a number  
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13 of perspectives, mindful that these may be overcome through creative collaboration and  
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15 cross-sectoral partnership. Collaborative co-design and social innovation methodologies can  
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17 be further used to support the development of a roadmap; models of transdisciplinarity  
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19 popular in the practice of social innovation can promote insights collected through  
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21 ethnographic modes of enquiry, design thinking and user-centred design. Such  
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23 methodologies take into consideration the inherently iterative nature of social transformation  
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25 that requires the continuous measurement of social impact to inform development strategies  
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30 (Mulgan, 2019).  
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32 Similarly, the interdisciplinary framework proposed in this paper is informed by  
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34 expertise from the field of social innovation as it pertains to the built environment, from the  
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36 perspective of the creation of equitable cities for the future, taking into consideration all those  
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38 elements which will be rendering the city resilient and sustainable in the holistic sense, in the  
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40 years to come. While many settlements have had a marginalized or unrecognized status for  
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42 many years, nuanced planning approaches in the Global South are bringing formal  
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44 recognition to these areas. New research is required to both bring a new understanding of  
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46 urban dynamics and interconnection, as well as to analyse, propose and measure the social  
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9 impact of urban transformation. This should include the examination of community-based  
10 models which allow vulnerable or marginal groups to participate more fully in the and design  
11 and eventual delivery of policy and planning solutions that are contextual and responsive.  
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16 When viewed as a networked approach to developing solutions to urban challenges, social  
17 innovation as a framework can provide a positive influence towards attaining the above.  
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23           Based on our experience in developing the present paper, specific methodological  
24 activities to be further explored may include the mapping of stakeholders and potential  
25 partners, ethnographic studies that inform the diagnosis of root causes and associated  
26 analysis, and invited participation of absent groups into a quadruple-helix collaborative  
27 holistic ecosystem. Hopefully these can provide pathways to creating further solutions in  
28 related areas in the future.  
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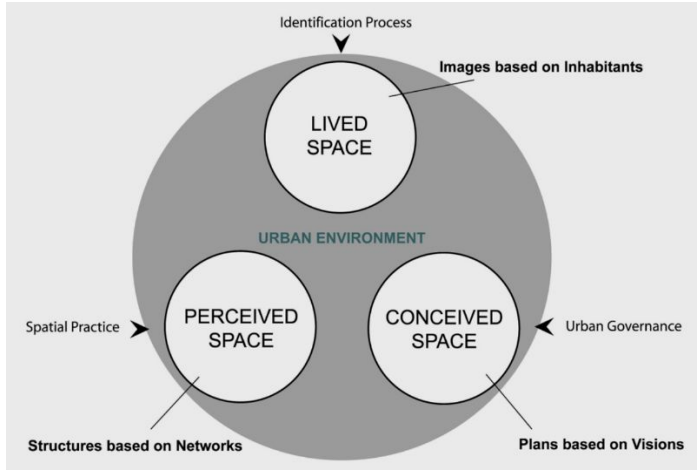
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**TABLE 1: CATEGORIES AND KEY QUALITIES OF UNPLANNED AREAS IN EGYPT**

Site/category	Example/case	Socio-Economic Conditions (and Political Decisions) that led to their development	Key Physical Qualities and Social Qualities
Squatter settlement developed on government/ public land.	Ezzbat Al Haganna	<ul style="list-style-type: none"> <li>The announcement of official planning schemes gave an opportunity for the poor to occupy areas near these schemes to be close to new job opportunities. (Temporary sites to settle workers near Nasr City, ring road)</li> <li>-an alternative for who cannot afford agricultural land, they build on desert state owned lands or buy it illegally from local brokers</li> </ul>	<ul style="list-style-type: none"> <li>Spatial characteristics like walkability, self-sufficiency, convenience and home/work proximity, safety in residential streets and participation in provision of public amenities.</li> <li>The social coherence of the communities in the informal areas has great potential; marginalized communities are forced to create closely connected social networks.</li> <li>Compact Urban forms with mixed use of residential and commercial uses that benefit the settlements; walkable, self-sufficient and convenient for daily needs, home/work proximity and safety.</li> </ul>
Squatter settlement developed on private land	Not Relevant in the Egyptian Context		
Settlement for refugees or vulnerable communities/ migrants	Not Relevant in the Egyptian Context		
Informal areas that were upgraded, but fell into a new cycle of deterioration	The migrants of the 1970s are now integrated in the communities		
Informal areas that were upgraded, but fell into a new cycle of deterioration	Not Relevant in the Egyptian Context		
Illegal sub-urban land subdivision on legally owned land.	Imbabah Cairo (on agricultural land)	<ul style="list-style-type: none"> <li>Rapid urban development grew in an informal unplanned pattern, housing displaced people from rural areas, especially Upper Egypt because in uncertain times buying land is much safer investment; due to Egyptian inheritance laws the land shares are divided equally between children and can lay around idle till disputes are settled or childless siblings arrange the Ministry or Awqaf</li> </ul>	<ul style="list-style-type: none"> <li>The same characteristics as the settlements on desert land, but differences in having a higher tenure security and the inhabitants are of wider socio-economic spectrum.</li> </ul>
overcrowded derelict legal social housing that became informal.	Al Zelzal housing in New Cairo	<ul style="list-style-type: none"> <li>Failure to understand the importance of the location, the importance of reciprocity in conditions of low-income and informal economies as well as the importance of social networks</li> </ul>	
Historic environments that were gradually deteriorated and became informal.	Parts of old Cairo such as Darb Al Ahmar		
Category not included in the typology: settlements in Cemeteries	City of the Dead Cairo	<ul style="list-style-type: none"> <li>Guards are employed to take care of graves, and over time they settle there with their family, children and grandchildren. It is the destination for the poorest immigrants.</li> </ul>	

**TABLE 2: CHALLENGES OF UNPLANNED AREAS AND PROPOSED STRATEGIES**

Site/category	Key Challenges (Water and others)	Main identified water challenges	Intervention Strategies	Aspiring proposed actions for entrepreneurship and innovation
Squatter settlement developed on government/ public land.	Lack of facilities, amenities and infrastructure Most have electricity, but water and sanitation vary from one area to another	Weak water infrastructure; some settlements do not have water in houses	The current strategy the country applies is relocation and redevelopment. People are relocated either temporarily while redeveloping the area, or permanently to public houses which are poorly located with no available jobs and livelihood, not meeting people's needs	<ul style="list-style-type: none"> <li>• Water courriers ('just drink'): small fee to transport water /distribute to communities (business opportunity)</li> <li>• Set up self help child care to facilitate the process of enterprising in water</li> <li>• Water tank for intermittent supply (between communities)- use similar best cases from Africa</li> <li>• Implement simple testing kits to identify problems</li> <li>• Use textile/knitting skills to create water filters</li> </ul>
Illegal sub-urban land subdivision on legally owned land.	The settlements on private land tend to be of higher quality than squatter settlements on the public land	Agricultural lands are more easily illegally connected to any public networks, especially to already existing water connection points	The current strategy the country applies is relocation and redevelopment. People are relocated either temporarily while redeveloping the area, or permanently to public houses which are poorly located with no available jobs and livelihood, not meeting people's needs	<ul style="list-style-type: none"> <li>• Capacity building in specific trades or schemes</li> <li>• Water point committees and the development of partnerships with established institutional stakeholders like NGOs and Banks</li> <li>• Introduce digital (e-payments) to boost savings and safeguard funds/sales</li> <li>• Product differentiation (clean bottled water- different colour per village) to prove purity led by women</li> <li>• Community groups to share water saving ideas and good practice</li> <li>• Explore the set up of water user associations</li> <li>• Raise awareness about global dimensions of the problem and highlight set of barriers</li> </ul>
Overcrowded derelict legal social housing that became informal.	The deterioration of the houses and most of social houses are built in the periphery far from jobs and does not have the same qualities of compact urban fabric	Weak water infrastructure		<ul style="list-style-type: none"> <li>• Permaculture</li> <li>• Help develop smartphone apps to connect and share and reporting GPS</li> <li>• Create a thread impregnated with water purifiers</li> </ul>
Historic environments that were gradually deteriorated and became informal.	Parts of old Cairo such as Darb Al Ahmar			<ul style="list-style-type: none"> <li>• The housing stock deteriorated overtime as mostly its rent value has been frozen at 1944 rent values</li> </ul>



**Figure 1- A framework for investigating the production of the urban environment following Lefebvre's Triad (Salama and Wiedmann, 2013)**

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<b>Turning our codes into themes</b>	
<b>Codes</b>	<b>Theme</b>
<ul style="list-style-type: none"> <li>•Whole community</li> <li>•Communal collaboration</li> <li>•Stakeholder collaboration</li> <li>•Improving community</li> </ul>	Societal impact
<ul style="list-style-type: none"> <li>•Out of the box</li> <li>•Innovative ideas</li> <li>•Alternative solutions</li> <li>•Community solutions</li> </ul>	Social Innovation
<ul style="list-style-type: none"> <li>•Understanding legalities</li> <li>•Need for training</li> <li>•Entrepreneurial activities</li> </ul>	Entrepreneurial support

**Figure 2 - Sample clustering codes**

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**IMAGE 1: Negative sanitation systems - untreated sewage canal in a village on the borders of GCA (Samy Habib, 2019)**



**IMAGE 2: A girl helping in delivering drinking water in blue barrels (Samy Habib, 2019)**

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