

# Applying Digital Communication and GIS for Community Planning and Development, Duhok as a Case Study

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**ABSTRACT:** Nowadays GIS is widely used in community planning and development and digital communication is taking a wide scope particularly in delivering different messages and ideas that can be useful in enabling community and planning. This study attempted to use the potential power of both tools by engaging young persons to express their voices and perspectives so as to contribute to planning and developing their community. Thirty middle and high school and university students were trained in use of photovoice and digital storytelling to depict their living environment and highlight issues of concern regarding the urban/living environment with the hope of bringing them to the attention of the local decision-makers so as to address them as public issues that require immediate consideration. This initiative which meanwhile aimed to promote participation of young people under 18 years in community development resulted in identifying a number of urban/living environment issues which are a public concern. On top of the issues identified were the poor management of (solid) waste and poor transportation system/structure which have led to a combination of environmental pollutions with multiple impacts on the residents. The produced photovoices, digital stories and GIS maps proved to be efficient means for sharing public issues with the wider audience using social media especially Facebook.

**Keywords:** Digital storytelling, photovoice, GIS, community planning and development, urban and living environment

## 1. Introduction

Digital communication is an efficient method in communicating public messages and has the potential for contribution to community planning and development especially it involves the public particularly disadvantaged and marginalized groups like children and even youth. It can be efficiently used to articulate people's needs and highlight issues related to living/urban environment and express their aspirations. Tools like photovoice and digital storytelling (DST) are affordable and easy to access especially by young people.

Relevantly, several international declarations, initiatives, and studies were made to uphold the rights of children in participation and decision-making in matters that affect them. Among which are the Universal Declaration of Human Rights of 1948, the United Nations Convention on the Rights of the Child (CRC) of 1989, the Growing Up in Cities program of the United Nations Educational, Scientific and Cultural Organization (UNESCO) which was proposed by Kevin Lynch, the city of Boulder's Growing Up Boulder program (GUB), seven realms or approaches to child participation in city planning and design developed by Francis & Lorenzo (2002), and the field photovoice study conducted by Caroline Wang and Mary Ann Burris in China in 1997.

Based on the potential contribution of young people including children in the planning and development of their living/urban environments, this study uses the potential of digital communication tools namely photovoice and DST for capturing the perceptions of 30 young people (students) about their living/urban environments, whether positive or negative, and encouraging them to express their needs and wants.

Hence, this study was aimed to explore the potential of young people in contributing to community development and to strengthen their participation capacity by providing them with the opportunity and means for gaining skills and self-expression especially about the living environment – an approach used by Daskolia et al. (2017). It was also intended to create awareness among the public and the decision-makers about the potential of young people in expressing their perspectives about their living environment, identifying public/community issues, and joining efforts to address them using available, affordable and most efficient means including digital stories and photovoice communication.

This study was initially a grant received by the author from the Fulbright Program – U.S. Department of State and was implemented in three stages or a 3-day workshop that covered a range of afore-mentioned relevant topics. The results were analysed following the seven realms or approaches to child participation in city planning and design to address the following two research questions:

- 1) How far the digital communication and Geographical Information System (GIS) are effective in highlighting, communicating, and addressing public/community issues?
- 2) To what extent the youth in the study area is responsive to community-based initiatives, i.e., calls for participation in identifying issues that need to be addressed for the common benefit?

The study results indicate that the target areas (Duhok City and Sharya town, about 7 km to the south of Duhok – both located in Kurdistan Region of Iraq) suffer from a plethora of closely interlinked urban environment issues with negative impact not only the population but also on the living environment. Important of these issues are:

- Poor management of garbage especially solid waste mainly due to lack of awareness in proper disposal and waste treatment and management facilities;
- poor transportation system and structure due to high car population compared to the existing transportation infrastructure and inefficient traffic regulations, increased traffic congestion;
- lack of green cover and improper management of unused vacant lands;
- lack of access to basic life needs such as housing and winterization supplies especially by internally displaced persons (IDPs) and vulnerable groups;
- increased use of electricity generators due to lack of power generation facilities, high dependence of fossil fuel for generating electricity and lack of adoption of alternative sources of energy;
- increased construction of high-rise buildings namely residential towers inside cities without conducting proper studies on the negative impact of these buildings especially on the residents in terms of obstruction of sunlight and views, design, traffic congestion, etc.;
- use of traditional designs for buildings especially in 1980s and 1990s which considerably do not conform to environment-friendly building design principles such as green spaces; and
- destruction of the countryside through construction of buildings (villas, cottage houses) in Duhok Dam area and the city outskirts. The major end results of these urban/living environment issues are environmental pollution, lack of green cover, and health issues and hazards for the population.

## **2. Literature review**

### **2.1 Public Participation**

Although public participation in urban planning and design is an important principle of democratic participation and community development and that community involvement is central to the development of community, people are generally not adequately engaged. Because of this situation, conventional methods of public participation like questionnaires and public hearings do not usually meet their purposes (Irvin & Stansbury, 2004). In particular involvement of young people in urban planning is still challenging (Lansdown, 2010) and insufficient (Wilks & Rudner, 2013). The situation is worse for children participation. Based on available literature, planners usually tend to “keep kids in mind” by including child-related public facilities such as playgrounds in the (master) plans, rather than involving them in developing these plans. In contradiction to this, some other literature (e.g., Barry et al., 1995) indicate that planners usually do not promote youth participation in community planning; they even do not consult with or invite young people to planning activities. Moreover, there are no planning agencies concerned with involving young people in the planning process.

### **2.2 Children’s Rights in a City**

Although the Universal Declaration of Human Rights, which was ratified in 1948, includes the rights of children, however, “some child advocates were concerned that children were not adequately protected, given their dependency and special needs (Edmonds & Fernekes as cited in Derr et al, 2013). Efforts of the child advocates resulted in the adoption of the United Nations Convention on the Rights of the Child (CRC) by 1989 [3]. CRC stipulates children’s rights to freedom of thought and expression especially in all matters that are related to them, and requires governments to do, among many things, guarantee children

participation in civil society. (Derr et al, 2013) How to realize children's rights in the city, urban design, and decision-making, i.e., implementation of the CRC articles was left for the governments to decide.

In support of the fulfilment of children's rights, the Growing Up in Cities program of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which was initially proposed by Kevin Lynch proposed in 1970s, was revived and became part of the CRC. With creating this program, Lynch intended to engage young people (children) under 18 in evaluating their urban environment (neighborhoods and public places) in order to influence cities to be more responsive to young people's needs and to make the needed changes. In fact, it was intended to involve the young people in participatory planning and design processes. (ibid)

Another program that uses participatory approaches in urban planning is the Growing Up Boulder program (GUB), which was initiated in Boulder city, Colorado in 2009. It is aimed at integrating the perspectives of children and youth into urban planning and design. (ibid)

According to Francis and Lorenzo (2002), there are seven realms or approaches to child participation in city planning and design: advocacy, romantic, needs, learning, rights, institutionalization, and proactive. This study focuses specifically on the needs and rights realms to involve children in the city (community) planning with two objectives: "define the spatial needs of children and incorporate them into design" and "mandate children's participation in planning and city decision-making".

### **2.3 Children Participation**

Although adult citizens are engaged to some extent in making decisions regarding shaping urban areas, young people and children in particular are not involved in such decisions although they are the ones who are the most affected by the impact of these decisions (Frank, 2006; Derr et al., 2013). In fact, children are affected by the places and spaces around them as much as adults are affected (Rees et al., 2016). Recognizing this situation, the United Nations (UN) promotes the rights of children through article 12 of the UN Convention on the Rights of the Child, which stipulates that children should have the opportunity to express their views in matters that affect them, including urban planning (Reiersølmoen et al., 2018). Based on these affirmations, it is important that children live in healthy and accessible cities (Gaster, 1991). Specifically, researches emphasize that children's unique needs should be considered in designing the living and urban environments, including nature (Chawla, 1986), plants (Moore, 1993), and vegetation for children (Moore & Wong, 1997).

Participation of children in city design has become increasingly popular and common. Considerable research has been done on the value of children's participation in planning and design (Hart, 1992). This has become more evident with many cities like Berkeley in USA and Milan in Italy involving children in city planning and designing processes such as neighbourhood landscape and parks, and even incorporating children's ideas into their plans and policies (Francis & Lorenzo, 2002). Even international organizations like UNICEF consider "children's participation as the best way to make cities more friendly and sustainable" (UNICEF, 2000). This led to a belief that children were the best designers and builders of environments for themselves (Francis & Lorenzo, 2002).

Studies also show that children were involved, for example, in placemaking processes (Foth et al., 2009), in the co-design of local public spaces (Saad-Sulonen & Horelli, 2010), and in redesigning local parks (De Lange & De Waal, 2013). This supports the assumption that children do not only need urban spaces but should be engaged as participants in the planning and design of attractive spaces (Derr et al, 2013).

### **2.4 Youth Participation**

Youth participation can be defined as the process of actual involvement of young persons, including children, in the decisions and initiatives that affect their lives by making efforts to solve common problems through community-based programs. It can take various forms, such as social action, community planning, public advocacy, community education, and local services development (Barry et al. 1995).

While adults often overlook the capacities the young people and consider them as the "cause of community deterioration" (Greene et al., 2018), youth participation has evolved over the past few centuries with youth being portrayed as "little adults" and treated as "regular workers on farms and factories" in the 19th century, to being viewed as "victims of urban-industrial society" who should be protected from "neglect and abuse by "adults" (Barry et al. 1995), recognized as "resources" in the 20th

century (Kurth-Schai, 1988), and regarded as “active citizens” with the right to participate in community planning (Barry et al. 1995). Meanwhile, participation of young people in different urban planning processes has been recognized as important in developed countries like Norway where laws give young people the right to active participation (Norwegian Government, 2008). The youth are even recognized as “fully legitimated actors” (Reiersølmoen et al., 2018). Therefore, involving young people in community and urban planning is important simply because they have the potential of evaluating their environments and generating new ideas (Norwegian Government, 2008).

## **2.5 Community Planning**

Community planning can be made through youth-led initiatives including planning programs at the local level (i.e., neighborhood) which may consist of several steps, such as assessment of local conditions, development of action plans, and leverage support for implementation (Barry et al. 1995). It is initiated:

- in reaction to existing community issues like the need, for example, to improve air or water quality through assessing the risks posed by improper management of solid wastes and submitting a proposal to the decision-makers (Lewis, 1991);
- as proactive to address a forthcoming risk, such as joint assessing and planning community needs, and developing and funding “proposals for youth programs” (O’Neil, 1990).

## **2.6 Potential of Youth**

Youth, if empowered and have active collaboration with adults, can play an important role in the public decision-making and community planning, development and success (Sherrod et al., 2002). Relevantly, researchers recognize the capacity of young people to contribute to building their communities particularly at neighbourhood and city levels (Zeldin et al., 2003). Therefore, it is important to integrate voices (ideas and concerns) of the youth into the (re)design of urban areas and identification of issues for city planning (Sherrod et al., 2002). Researchers have also explained that sharing decision-making and power in participatory research has the potential to foster young people’s sense of belonging and identity and facilitate their capacity for contributing to the well-being of their communities (Greene et al., 2018). For example, with the images about the urban environment, youth can influence changes in their communities (Denner & Martinez, 2015).

## **2.7 Benefits of Youth Involvement in Planning**

Engaging youth in local planning offers multiple benefits to the community and to young people themselves. There is also an agreement among researchers and practioners about the benefits of the youth participation; some of which can be summarized as follows:

- Improved plans – by providing decision-makers with perspectives and inputs to improve plans about the needs and issues most relevant to youth.
- Leadership opportunities – by having an opportunity to acquire new knowledge and skills, and identify and address issues or challenges that directly affect the youth.
- Citizenship and service – through involvement in local planning to better understand the community and to address the public issues.
- Better use of youth-serving resources - through better identification of youth needs and interests for better use of youth programs and services (ILG, 2010).
- Individual involvement with positive psychosocial results (e.g., improved open-mindedness, personal responsibility, moral development, a sense of efficacy and self-esteem), as well as increased interaction in the improved sense of community service and reflection on important community issues (Calabrese & Schumer, 1986).
- Organizational development: by engaging youth, to build their capacity, in formal organizational processes, such as setting priorities, formulating plans, and implementing programs without adult intervention (Winn et al., 1992).
- Community development – by enabling youth to plan programs for development of community infrastructure, like rehabilitation of abandoned buildings (Stoneman, 1988), and contribution to enhancing economy through entrepreneurship and business development (Heartland Center, 1988).

## **2.8 Methods and Tools applied to Community Planning**

### ***Digital Storytelling***

Storytelling provides people with opportunities to capture, share, and preserve their experiences and knowledge, and to express themselves, develop new perspectives, and build their identities (Daskolia et al., 2017). It has relationship with space and is considered as a form of spatial practice (Collie, 2011). With the increased access to social media since mid-1990s, traditional storytelling has evolved into digital storytelling (DST), which is the practice of making and telling stories through a combined use of digital media (material and tools), such as photographs, videos, sound, music, graphics, and animations. DST is the “practice of making and telling stories through the use of digital media” (Daskolia et al., 2017). It is a narrative-based, innovative, bottom-up, participatory community-based research method and a set of co-creative activities that help engaging individuals, groups of people, and communities in imagining places and in research complexities of urban experiences across different perspectives, and integrate people’s experiences in urban planning, development and policy-making (Collie, 2011; Lal et al., 2014; Lorini et al., 2017). A digital story is a narrative short (2-3 minute) movie-like or cartoon-like video – a multi-media digital tool with a combination of narrative (text), visual (digital video, still photographs, artwork (graphics and animations), audio (music and voice) mediums to express an individual or a community story (Davis, 2011; Derr et al., 2013; Lal et al., 2014; Daskolia et al., 2017; Du Preez, Barnes & Thurner, 2018).

DST is used for creating and sharing knowledge and for conveying personal or community stories especially about the built environment (Gubrium, 2009). It is a vital tool in urban design and community engagement (Collie, 2011). It is useful especially by giving disadvantaged communities and marginalized people a voice and an opportunity to share their thoughts and ideas (Lorini et al., 2017; Du Preez, Barnes & Thurner, 2018). DST also gives the community a voice, a real means of self-expression, and an opportunity to talk about their experiences especially the living environments (Davis, 2011). It stimulates generation of new ideas and knowledge and participation in the urban design process (Gubrium, 2009; Lorini et al., 2017).

### ***Photovoice***

Photovoice is a unique participatory qualitative (action) research and a tool that allows people through photography and storytelling to describe the conditions in their living environment, identify and express thoughts about local issues in an attempt to work for solutions by communicating them to decision-makers. It is “a process by which people can identify, represent, and enhance their community through a specific photographic technique” (Wang & Burris, 1997). More specifically, it is a process in which people particularly those with limited power use photo images to describe with some written text different aspects of their environment and experiences and share them with others (Community Toolbox).

Photovoice was developed by Caroline Wang and Mary Ann Burris (1997) by fielding a number of rural women in China to picture their living environments and then discuss these pictures, and then hosting an exhibition of their photographs for the public. Hence, they managed to create awareness among the public and the policy makers about their needs (University of Kansas, 2014).

Photovoice is a tool that is easy to learn, flexible and accessible to almost everyone, and is considered more effective than other participatory tools since “a picture is worth a thousand words” (Sutton-Brown, 2014) as images can be understood regardless of the viewers’ language, culture, or other factors (University of Kansas, 2014). Therefore, it is used to visualize individuals’ experiences and perceptions about their daily realities and issues that could be difficult to express with words. It is used for needs assessment especially when changes are needed (Wang & Burris, 1997). As a participatory action research method, photovoice enables youth to record issues of concern, community assets, challenges, and opportunities hoping that stories they tell might affect change (Wang & Pies, 2008).

Photography and video recording provide a means for participation and empowerment without requiring people to stand up and speak in public. Specifically, marginalized people who lack a voice in

the community, members of minority groups, and children and youth in difficult circumstances (University of Kansas, 2014).

Photovoice and DST were used in “creating interactive planning models” (Derr et al, 2013) in the Growing Up in Cities program of the UN Educational, Scientific and Cultural Organization (UNESCO) and Growing Up Boulder program (GUB), as well as in other studies (Wang & Burris, 1997; Meadows, 2003). These participation methods, like other methods that facilitate discovery and expression, are considered to be most effective for engaging children and youth in contrary to the conventional methods such as participation in interview and public meetings (Derr et al, 2013).

### GIS and Urban Planning

Since 1980s', GIS has been increasingly used in urban planning particularly in the development at different stages, levels, sectors, and functions. (French and Wiggins, 1990) It is an important tool of urban planning and useful for effective decision-making in urban planning (Han and Kim, 1989). It has been very useful in many areas of urban planning (French and Wiggins, 1990; Levine et al., 1989). Its main uses in urban planning include database management, visualisation, spatial analysis, and spatial modelling. (Levine et al., 1989; Webster, 1994). Some of the key areas of its application include analysis of existing situations, database management, mapping, and spatial analysis functions. The mapping functions include for example use of databases and models to analyse the existing situation in a city.

### Storytelling and Mapping

Storytelling and (traditional) mapping have been used together since ancient times by cartographers and raconteurs for producing story maps in order to convey stories and tales about significant people, places, and events. They have “played a pivotal role in the evolution of society and the broader world.” Recently digital mapping through GIS has been used increasingly in replacement of traditional (paper-based) maps to create digital story maps but with at a wider scope encompassing different themes and topics, i.e., “multiple uses in diverse domains.” For example, they are used to produce a story which can be “ancient history of an exotic tourist destination, the geographical features in a region, education systems in different countries, or simply a comparison between the living standards of two cities.” Use of GIS for mapping and storytelling has created an innovation in the realm of DST especially by connecting data, images, narratives, and maps (NNTW, 2022). For this study, GIS was used to map the locations of the urban/living environment issues and impacts identified by the study participants, and to visualize the extent (reporting frequency) of these issues or impacts (Chaturvedi, 2017).

## 3. Methodology

The concept of this study was based on the approach developed by Kevin Lynch in the Growing Up in Cities Program and the GUP-which involved young people in the urban planning and design. Implementation of the study followed the approach used by Caroline Wang and Mary Ann Burris (1997) by using photovoices and DST to enable young people to describe and discuss their living environments. It also followed a step-by-step participatory approach that engaged thirty students (13-22 years in age) from three middle and high schools and undergraduate students from diverse social, economic, and geographic backgrounds. Participants were mainly drawn from Duhok city (Duhok Ishik Preparatory School for Girls which is a private international school and University of Duhok (UoD) Spatial Planning Department) and Sharya town (Kelabadre Preparatory School and Mezgeen Basic School) (Table 1). Selection of participations was based on the students' interest in the study topics and their time availability.

Analysis of the study results was based on the Francis & Lorenzo's (2002) seven realms or approaches to child participation in city planning and design.

**Table 1.** The study participants

School	Location	Type	Number of Participants			Age Group in Years		Level
			Male	Female	Total	13-17	18-22	
Duhok Ishik Preparatory School for Girls	Duhok city	Private	0	9	9	9	0	Level 8: 2 Level 9: 2 Level: 10: 3 Level 11: 2
Kelabadre Preparatory	Sharya town	Public	0	3		1	2	Level 12: 3

School				3				
Mezgeen Basic School	Sharya town	Public	2	3	5	5	0	Level 9: 5
UoD Spatial Planning Department	Duhok city	Public	2	11	13	0	13	
			4	26	30	15	15	

Based on similar studies conducted previously (e.g., Caroline Wang & Mary Ann Burris, 1997), this study was implemented in three stages under a 3-day workshop where participants received theoretical and practical knowledge in a range of relevant topics as explained below.

- Stage/day 1: was dedicated to introduction of participants to digital communication and use of this tool in describing the urban/living environment, and to preparing their engagement in photovoice and DST works.
- Stage/day 2: gave participants the opportunity to reflect on the digital stories and photovoices they produced following day 1 and identify the urban/community issues that they thought should be highlighted and improved. Collections of the produced works were resented to participants in a plenary session, discussed and commented. Then, the works that most realistically depict the community needs were selected for public display.
- Stage/day 3: included an exhibition in each of the three target schools where participant's digital stories and photovoices were presented and displayed respectively.

Moreover, the study somehow follows the two international approaches used for DST by Daylan Davis (2011):

- Three-day DST method developed by Joe Lambert (2007) which includes a sequence of processes – writing script, creating storyboard, revising script, sequence images, adding narration, transitions and soundtrack, and completing story.
- Three-day 4-stage BBC Capture Wales process with the following processes: The stimulus, the script/recording, editing and production, and publishing and signing off (Meadows, 2003).

All the works in either approach were made by 1-2 storyteller with technical support and instruction provided by a facilitator (the author). To facilitate and stimulate group discussion, SHOWeD guide developed by Wang and Burris (1997) was used to encourage and help the participants answer the following questions for each photo or videoclip selected for presentation:

What do you **See** here?

**What** is really Happening?

How does this relate to **Our** lives?

**Why** does this problem or strength exist?

What can we **Do** about it?

### Data Collection and Analysis

The digital stories and photovoices developed by the study participants were complemented with interviews made by the researcher with the participants. This was a useful data collection method as it allowed participants “open up about their personal perceptions” of their urban environments (Nykiforuk et al., 2011a). The texts and narratives contained in the photovoices, digital stories and subsequent interviews were transcribed. A thematic coding, which is a form of qualitative analysis, was conducted where common codes in the transcripts were identified and grouped under identified themes (Nykiforuk, et al., 2011b). This is an approach followed by Matthew Miles and Michael Huberman (1994) and Keith Punch (2013). The data were initially chunked into smaller segments and a code was attached to each to represent an urban/living environment issue or impact (Leech & Onwuegbuzie, 2008). This method helped identifying recurring patterns in the data through cross tabulation of the codes to validate common themes – patterns of urban/living environment issues that are common in the study areas.

The analysis was primarily based on qualitative inductive coding, data organisation in tabular format, and drawing and verifying conclusions. The data sets were constantly compared to ensure the analysis was inductive and well-grounded in the data. Three types of variables or measures were included in the analysis: Key urban/living environment issues that the participants considered of concern and required immediate attention and their causes, side effects, and end results or impact. The analyzed data helped

explore how effective was the engagement of children in the identification of strengths and weaknesses about their environments.

#### 4. Study Findings

Twenty-eight digital stories and two photovoices were produced by the thirty participants, mostly as individual works. Majority of the works have clearly identified titles while others have the titles implicit, i.e., in the contents. Again, most of the topics have contents with negative perspectives (trend), i.e., the author(s) was not satisfied with that particular aspect of the urban/living environment (Table 2).

**Table 2.** Topics of produced digital stories and photovoices

#	Topic	Location	Trend	
			Positive*	Negative**
Digital stories and photovoices made by participants from Ishik Preparatory School				
	Nature	Deleb village in Semel district		X
	Plants	Avro City RC	X	
	Building with Gardens	Residential apartments in Duhok city		X
	Having Gardens	Zrka Q. *, Zrka Q. (vacant lands around UoD campus and in other areas)**	X	X
	Water Shortage	Duhok Dam		X
	Duhok Dam Pollution	Duhok Dam		X
	Power Generators	Malta Q.		X
	Car Accidents	All areas in Duhok city		X
	Family Mall	near Semel and Tenahi towns	X	
Digital stories and photovoices made by participants from Sharya town schools				
	Power Generators	Sharya town		X
	Improper Disposal of Garbage	Sharya town		X
	Dirty Environment	Sharya town		X
	Dirty Environment	Sharya town		X
	Living Environment of IDPs	Sharya town		X
	Living Environment of IDPs	Sharya town		X
	Deteriorated Rural Road	Sharya town		X
	Library	Sharya town	X	
Digital stories and photovoices made by participants from UoD Spatial Planning Department				
	Killing the nature is a crime	Duhok Dam area		X
		Masike Q. (vacant lands)**		
	Parks in Duhok city	Masike Q. (neighbourhood park)*	X	X
		Zrka Q. (Dilshad community park)*		
		Masike Q. (Zariland community park)*		
	Baroshke and Bazaar streets – Traffic congestion	Baroshke Q., Bazaar (central business district) in Duhok city		X
	Dirt streets inside Duhok city	Masike Q.		X
	Dewra Hespa Roundabout	KRO Q.	X	
	Traffic Congestion in UoD Campus	UoD campus in Malta and Zrka Q.		X
	Accessibility in UoD Campus	UoD campus in Malta and Zrka Q.		X
	Zakho - Ibrahim Khalil International Road	Zakho – Turkey highway, Zakho area		X
	Jewish neighborhood in Zakho	Zakho city	X	
	Apartment towers	Kayar City RC, Zeriland RC		X
	Waste management in Duhok city	Kwashe village in Semel district		X
	Duhok Bazaar	Duhok City center		X
	Duhok Mall	KRO Q.	X	

\* Image described as having positive contents/characteristics, i.e., good living environment, or negative contents/characteristics, i.e., unsuitable living environment that require immediate attention. Source: The author

##### 4.1 Urban/Living Environment Issues

Common themes were identified from the work title in association with the contents. Each work addressed not only one issue but more. The frequency of each urban/living environment issue or the end result (impact) reported by the participants was summed up to calculate its proportion (percent) out of the total number of participants (Table 3). Hence, two maps of Duhok area including Duhok city and Sharya town, one showing the issues and the other the impacts, were developed based on the frequency reported for each issue or impact per geographical area – city/town or neighborhood (Figure 1 & 2). A problem tree was developed connecting the issues with the causes and the effects – results (impact) (Figure 3).

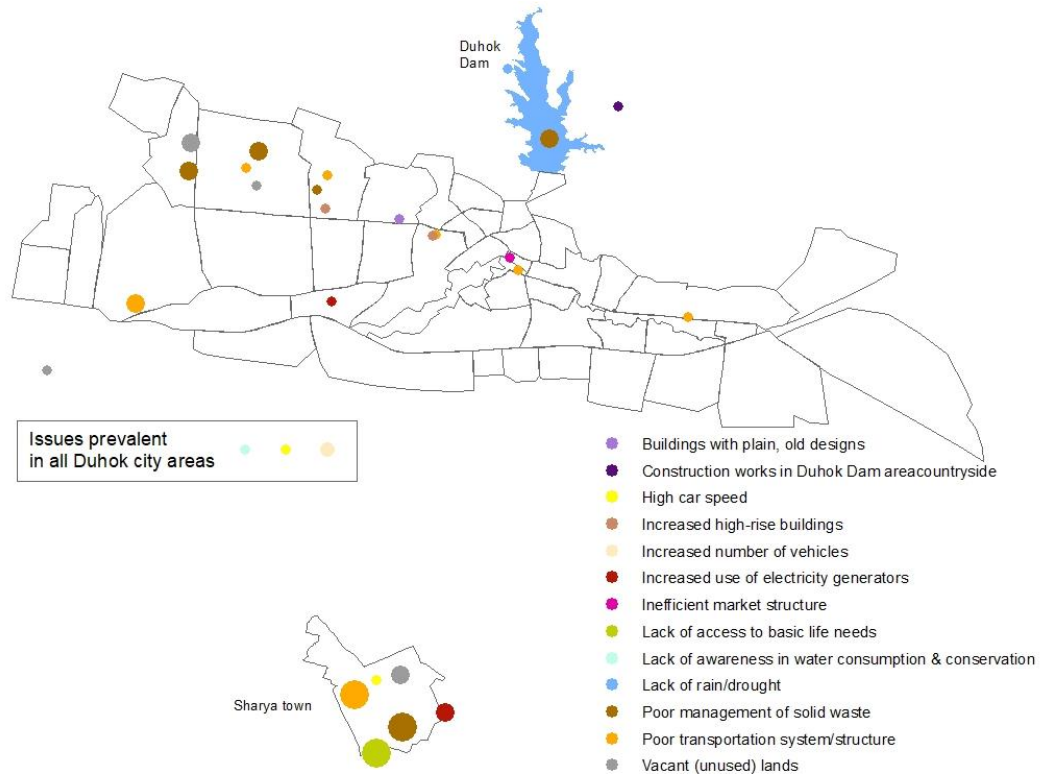


**Table 3. Identified urban/living environment issues and effects (results)**

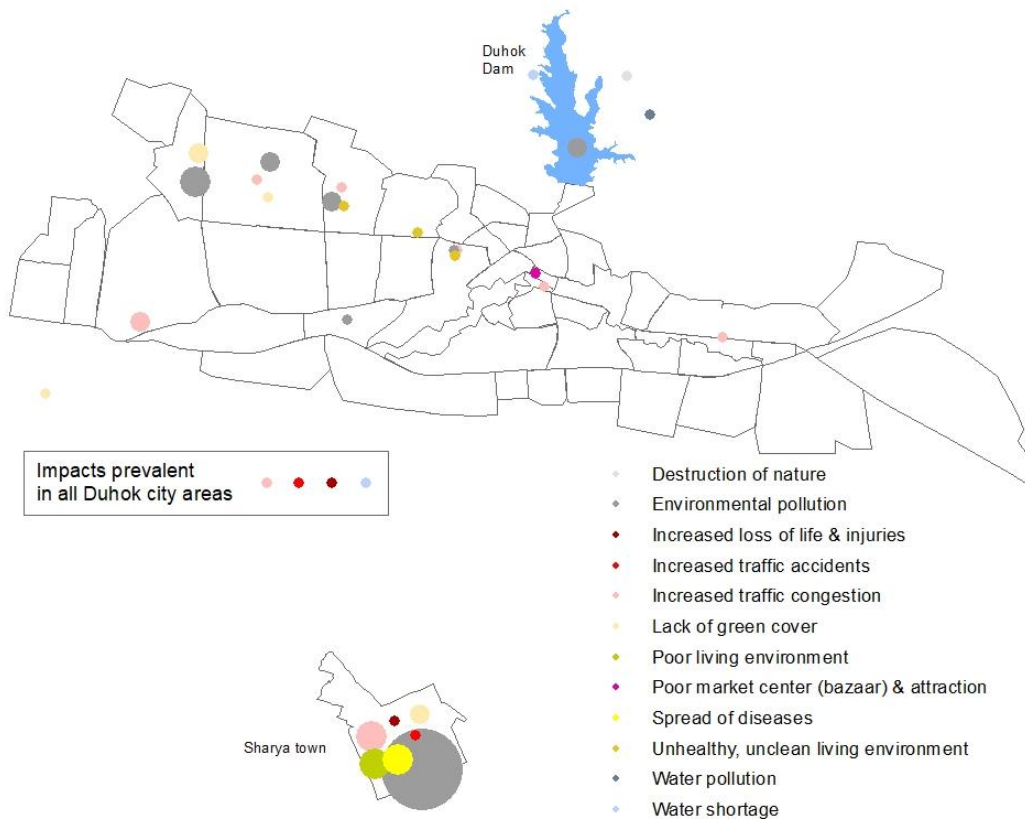
Urban/Living Environment Issues	Intermediary Results	End Results	Locations
Poor management of solid waste (15*) through improper disposal of garbage (9)	Dirty environment	Environmental pollution	Zeriland RC, Zrka Q. (2 - reported frequency), Masike Q. (2), Duhok dam area (2), Sharya town (5), Kwashe village, Jewish neighborhood - Zakho, Zakho-Turkey road.
Poor transportation system/structure (14)			Kayar City RC, Zeriland RC, UoD campus (2), Bazaar, Baroshke Q., Masike Q., Sharya town (5), Jewish neighborhood, Zakho-Turkey road.
Vacant (unused) lands (7)	Dirty environment	Lack of green cover; Environmental pollution	Zrka Q. (2), Masike Q., Delebe village, Sharya town (2), Jewish neighbourhood
Lack of access to basic life needs (housing, garbage collection, access roads, etc.) (5)	Dirty environment limited mobility	Poor living environment; Environmental pollution; Spread of diseases	Sharya town (5)
Increased use of electricity generators (4)	Dirty environment	Environmental pollution	Malta Q., Sharya town (2), Zakho city
High car speed (2)	Limited mobility	Increased traffic accidents; Increased loss of life and injuries	Duhok city, Sharya town
Increased high-rise buildings (2) not conforming to international standards (2)	Poor facilities; Lack of safety; Lack of privacy; Lack of cleanliness	Environmental pollution ; Unhealthy, unclean living environment;	Kayar City RC, Zeriland RC
Buildings with plain, old designs	Damages to nature		KRO Q.
Construction works in countryside	Destruction of countryside	Destruction of nature; Lack of green cover; Environmental pollution; Duhok Dam pollution	Duhok Dam (area)
Increased number of vehicles (1)	Limited mobility	Increased traffic congestion	Duhok city
Inefficient market structure	Lack of safety, poor market image	Poor market center (bazaar) and attraction	Dohuk city center (Bazaar)
Lack of rain/drought Lack of awareness in water consumption and conservation		Water shortage	Duhok Dam area Duhok city

\* means reported frequency

Source: The author



**Figure 1.** Urban/Living Environment Issues in the Study Areas (Source: The author using ArcMap 10.4.1)



**Figure 2.** Impacts of Urban/Living Environment Issues in the Study Areas (Source: The author using ArcMap 10.4.1)

As Table 3 and Figure 3 show, the study areas suffer from a plethora of urban/living environment issues that are closely interlinked and intertwined. These issues lead to one or more intermediary and end results with a detrimental impact on the living environment in the respective areas. For example, poor management of solid waste and improper disposal of garbage, construction works especially in forest and rangelands like Dohuk Dam area, and use of power generators all contribute to creating a dirty environment and cause different types of environmental pollution. It should be noted that the number of the study participants was not proportional to and not representative of the whole population in the study areas. In addition, participants were drawn from a small number of areas (neighborhoods). Thus, names of these areas were repeatedly cited in this report while names of other not-represented areas were not cited. However, this does not mean that those locations did not have any of the reported urban issues. In fact, many of the cited issues were reported in almost all the targeted areas.

Improper disposal of garbage is widespread particularly in Sharya town which is compounded by the existence of a large number of IDPs in and off camp while it already suffers from lack of public services, including garbage collection and supplies like trash bins, as well as deteriorated, unpaved roads especially in the IDP locations. Similarly, poor transportation system and structure are evident in all the study areas particularly in the urban core centers or central business districts, e.g., Bazaar of Duhok city, in the newly established residential neighborhoods or urban peripherals, and in the rural areas namely Sharya town. Also, increased use of electricity generators is undoubtedly a challenge faced by all the areas and neighborhoods regardless of the economic level, i.e., rich and poor neighborhoods. The most frequently cited urban/living environment issues were the poor management of solid waste (50% of reported locations/ participants), poor transportation system and structure (47%) combined with increased number of vehicles in Duhok city, in addition to the unused (vacant) lands (23%) mainly due to inefficient land use policies. A detailed description of the identified issues is as follows (also see Figure 4):

- a) **Poor management of solid waste (50%):** This is an urban and rural area issue, which is caused primarily because of improper disposal of garbage, lack of municipal services like regular garbage collection service and of peoples' awareness in the significance of environmental conservation and protection, in addition to inefficiency of **Kwashe waste management plant**. It usually leads to creation of dirty areas with different environmental impacts, such as air, water or soil pollution, "smelly atmosphere" and "horrible" scenes of garbage scattered everywhere. The impacts on the people are not only at health level, i.e., different diseases, but also at psychological level, for example being "sad" because of "unpleasant" scenes. The end result of the created environmental pollution is a dirty and unhealthy environment. This issue was most frequently reported in Sharya town, Zakho city, and along the main roads including Zakho-Turkey highway.
- b) **Poor transportation system and structure (47%):** This is a general issue but more in the urban areas where the increased number of vehicles and poor transportation planning and infrastructure (e.g., damaged or unpaved roads and streets, lack of crosswalks, traffic signs, sidewalks and (demarcated) parking spaces) and inefficient traffic system are evident. It causes a high degree of traffic congestion and limits the mobility not only of the pedestrians but also of the vehicles. In the semi-urban areas (Sharya town), this issue is more related to the poor (access) roads and streets as most of the transport infrastructure is damaged and unpaved, i.e., dirt, and lack storm water drainage side channels which obstructs mobility. It creates lack of safety not only for the pedestrians but also for the drivers.

All these factors cause high traffic congestion especially in the core center of Duhok city, (bazaar) and highly populated areas such as Baroshke quarter, and limited mobility of the vehicles and the pedestrians. This traffic congestion is also evident in Zakho city particularly in the central business

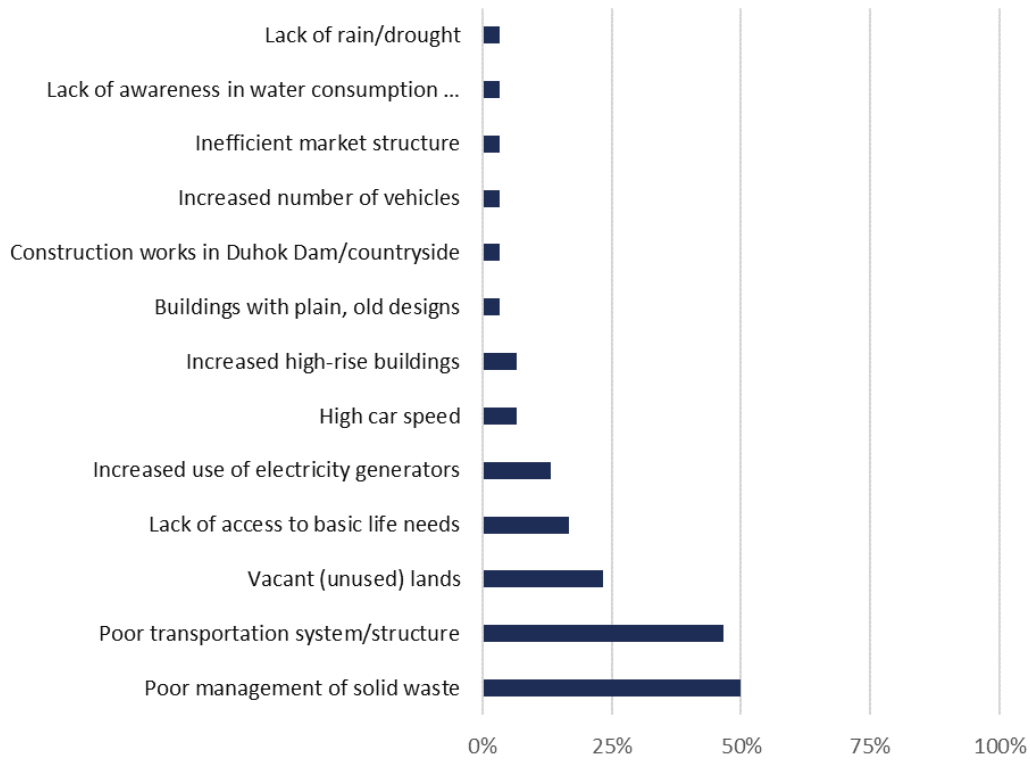
district. Combined with the poor transportation is the **high speed of cars (7%)** relatively in all the study areas including all neighborhoods of Duhok city which cause an increased number of accidents involving injuries and loss of lives.

- c) **Unused vacant lands (23%)**: This is more an urban area issue than a rural area issue; it is created mainly due to inefficient land use policies. Individual parcels or tracts of lands are left undeveloped in the residential areas – as reported in two neighborhoods in Duhok. The same is true for larger lands in the rural areas (Delebe village). The result is also a dirty environment because of different environmental pollutions (e.g., smelly areas, “non-freshened” areas, areas with health risks) created due to inability to properly manage the vacant areas as well as a lack of green spaces and beautiful landscapes that the city or the (semi) urban area is in urgent need to. According to many study participants, the vacant lands could be better used if planted with trees, flowers and other types of plants.
- d) **Lack of access to basic life needs (17%)**: This is a highly evident issue especially in the areas with high concentrations of IDPs and vulnerable people in Sharya town who have been suffering from **poor housing**, poor garbage collection services, poor access roads, etc. These cause difficult living conditions for the affected population and result in poor living environment with increased health risks for the residents.
- e) **Increased use of electricity generators (13%)**: This is an urban and rural issue that has existed since early 1990s not only in the study areas but also all over Kurdistan Region of Iraq. Lack of electricity power which is caused by the limited capacity of the power sources and lack of alternative power sources including environment-friendly sources (e.g., solar energy) has required more dependence on the power produced by the generators. Hence electricity fossil fuel-based generators have been the most available source of power at all levels (e.g., individual houses, private and public buildings, neighborhoods). As almost all the used generators especially those big generators that feed entire or portions of neighborhoods or parts of the cities and towns are not modern and lack standards like minimized emission of fumes and noise, environmental pollutants such as noise and leaked oil are unavoidable. The results are soil/land, water and air pollution, etc., which means a dirty environment and an environmental pollution.
- f) **Increased high-rise buildings (7%)**: These are residential apartment buildings which are reportedly do not conform to international standards especially in terms of location, i.e., proximity to lower residential houses with impact on the privacy of other residents of the area, causing blockage of and sunlight and views, and increased traffic. In addition, they do not offer all the required facilities such as sufficient green spaces and parking spaces.

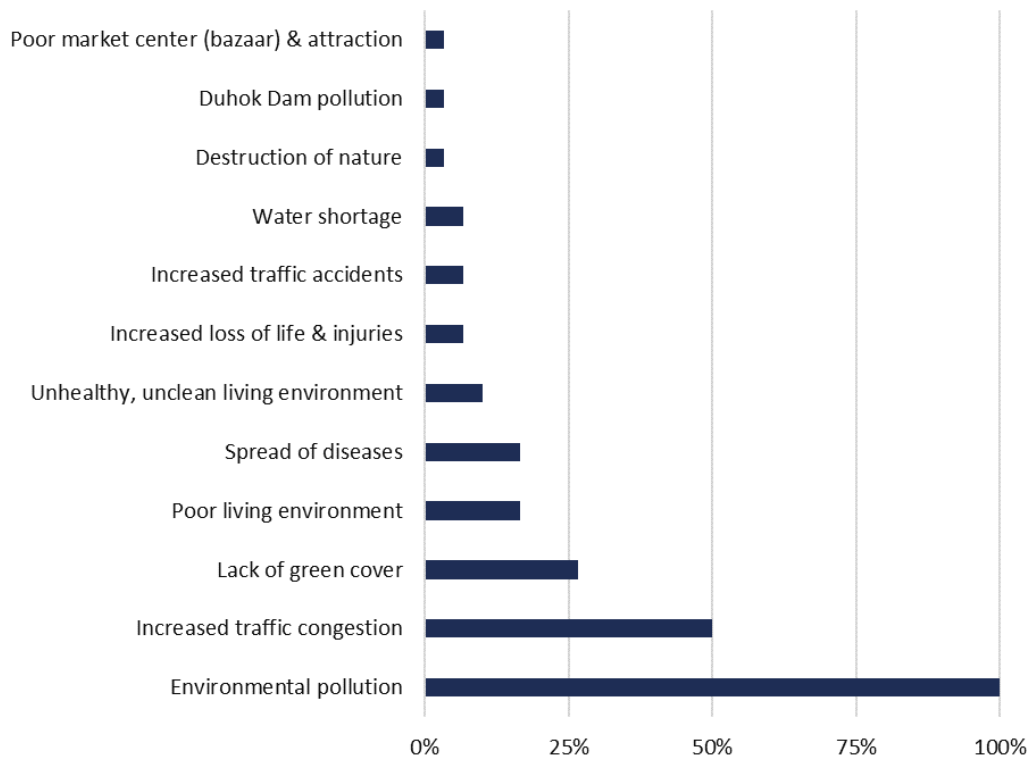
All above-mentioned factors together with the **“plain and old” designs of buildings (3%)** that lack environmental-friendly elements such as plants and trees are believed to damage the nature and cause environmental pollution. There are also other causes and factors that contribute to creating a dirty environment and leading to environmental pollution. For example, **construction of buildings (villas, cottage houses) in Duhok Dam area (3%)**. This issue has multiple impacts on the countryside (nature) through damaged forests and rangelands and pollution of Duhok Dam as a water reservoir and a potential tourist site. The end result is a dirty environment and environmental pollution.

#### **4.2 Effects of Urban/Living Environment Issues**

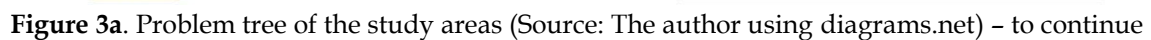
As *Figure 5* shows, the most evident impact of the reported urban/living environment issues is the environmental pollution (100%) which is caused by different factors as explained above. It is a concern in all the study areas. The second impact in the order of reported frequency is the increased traffic congestion (50%), which is also evident in all the study areas. In conjunction with the environmental pollution is the lack of green cover which has different causes, especially urban development and lack of efficient land use policies.



**Figure 4.** Urban/Living Environment Issues by (Frequency of) Locations and/or Participants

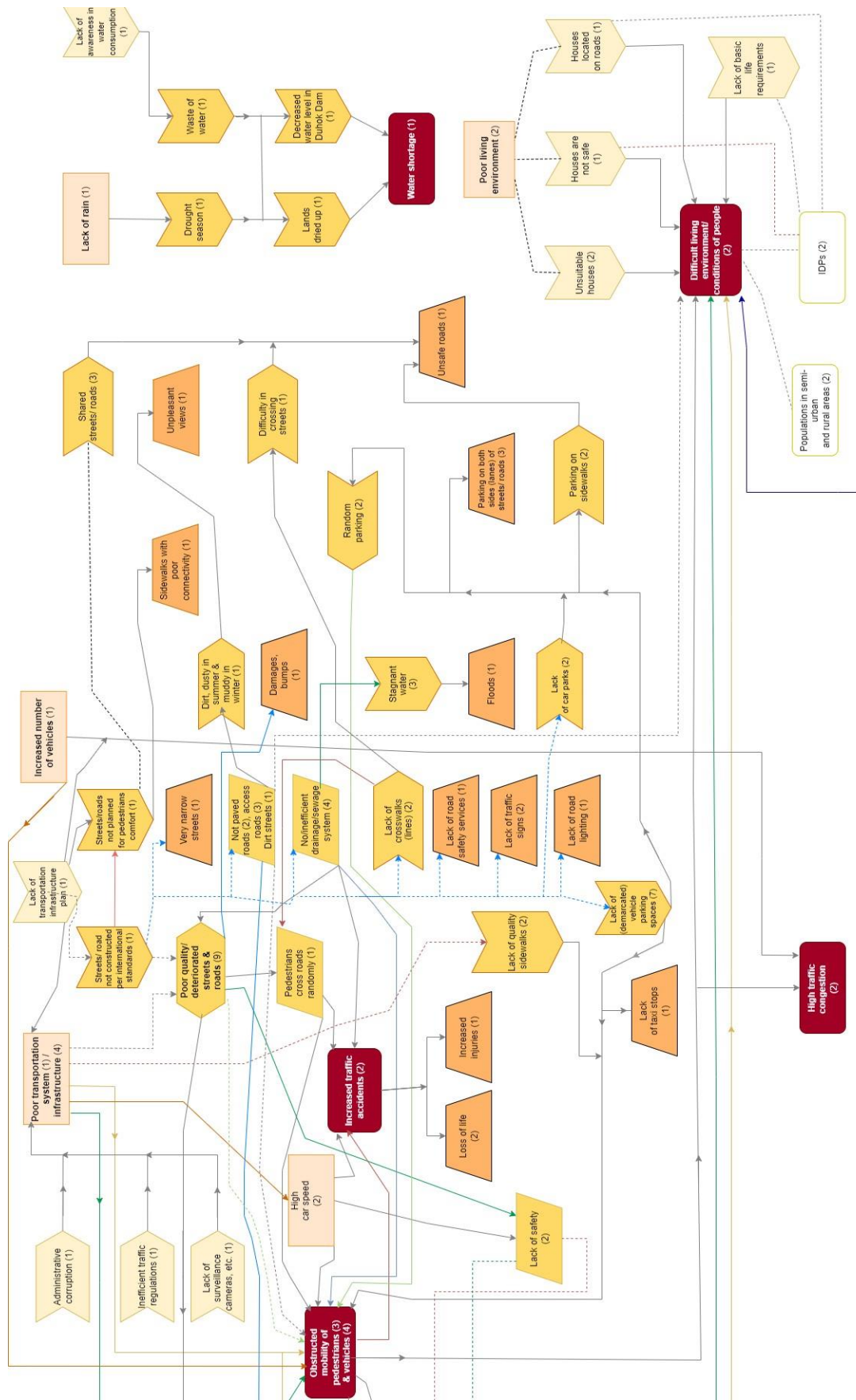


**Figure 5.** Impacts of Urban/Living Environment Issues by (Frequency of) Locations and/or Participants



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**Figure 3c.** Continuation of the Problem tree of the study are as

## Conclusion

This study involved use of photovoice and DST in an urban and semi-urban



an context to achieve multiple objectives including empowering young people by eliciting their perspectives toward their living environment and exploring their responsiveness to community-based initiatives. Another major objective fulfilled was exploring the potential of using photovoice and DST as tools for engagement of the young persons in describing their living environment, and identifying major issues of concerns that require appropriate attention. This was a unique initiative implemented in Duhok province where public decision-making and planning are usually based on a top-down approach with limited participation of citizens particularly children and youth.

With the training and equipment support provided under this study, 30 young students were able to use photovoice communication and DST for the first time as means of self-expression especially of concerns about urban and living environmental issues. The works they produced have proved that youth have the potential to contribute to community planning and development especially if they enjoy good collaborations with the adults. The study participants displayed the motivations needed for playing an important role in the community development and their participation in the study has created community awareness about the potential of youth and the need for creating community change, i.e., improvement, involving this important category of people.

Now it is important that planners specifically decision-makers particularly in city and town design to recognize the potential of the young people to and consider their participation and contribution to the community development. This requirement conforms to the principles of the American Planners Code of Ethics and Professional Conduct which stipulate that a planner should "recognize the rights of citizens to participate in planning decisions", and "strive to give citizens (including those who lack formal organization or influence) full, clear and accurate information on planning issues and the opportunity to have a meaningful role in the development of plans and programs" (APA, 1992).

Meanwhile, use of GIS to visualize the reported urban/living environment issues has been very useful to provide an insight into the density of these issues. It also enabled making comparison among different issues and across different locations. The potential of the GIS functions can be fully used to connect the narrative stories to the locations of the respective areas so as to create digital story maps.

This study was a limited initiative that was conducted at a small scale, i.e., in a few schools and a low number of participants. For the purpose of promoting participation of young people in the community, public planning and decision-making, it is important that combined efforts be made at a larger scale to gain some (semi) formal entity like a school study program or community movement with an aim of translating results of any similar studies into formal decisions and concrete and practical work. Towards this end, a number of recommendations is proposed in this study:

- It is important that the potential role of young people in community building (planning and development), decision-making and other matters that affect their lives be included in the school curriculum which would undoubtedly contribute to highlighting the potential and important role of this group.
- When planning at sectoral/public departmental level, it would be important to listen to the concerns of the young people in the respective sectors, even if they are not to be involved in the planning process.
- Development programs (local, national and international) should consider the participation of young people whether as beneficiaries or as planners and implementers, provided that a solid ground be prepared for participation of this group by building their capacity in public planning, decision-making and other relevant topics.
- All available resources need be tapped to initiate programs and activities that support and/or involve participation of young people. Private sector companies can be a good resource as the benefit may be mutual where the companies can take advantage of the participation of young people, for example, for commercial advertisement. Universities may play a vital role in making partnerships with the private sector for implementation of such programs with two possible directions: academic (study) and community development.
- It is necessary that policies be formulated for efficient management and optimal use of vacant lands for the public benefit with more focus on the needs of children and other young people, as well as marginalized and disadvantaged groups.

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