Re-coding Post-War Syria:
The Role of Data Collection & Objective
Investigations in PostWar Smart City

Mhd Ziwar Al Nouri[1], Bilal Baghdadi[2], Nairooz Khateeb[3]

[1] Reparametrize Foundation, University of Innsbruck Austria
ziwar@reparametrize.com
[2] Reparametrize Foundation, Lebanon
bilal@reparametrize.com
[3] Reparametrize Foundation, Austria
nairooz.kh.9@gmail.com

Abstract. Re-coding post-war Syria is an ongoing research and data platform, focused on innovation and collecting comprehensive, infrastructural and socioeconomic analytics, synchronization data, by using AI driven to give a more transparent image of innovating a new methodology to regenerate the future of post-war smart cities into advanced and sustainable urban environments in a smarter way (Fig. 1). The pressure to achieve a rapid Post-war smart city without clear strategy and comprehensive analysis of all aspects will cause a particularly catastrophic collapse in the interconnected social structure, services, education and health care system, leaving a long-term impact on the society. This paper presents the current status of the Research & Documentation methodology in the Data Collection phase by the objective investigations conducted through a series of local and international workshops species developed in this research called "Re-Coding", offering consequent direct ground surveys, statistics and documentation study of the targeted areas, merging professionalism and youth power with local community to detect an open source data used as a tool to re-generate a precarious area towards a new methodology.

Keywords: Post-War Smart cities, Collecting Data, Local community, Objective Investigations, Artificial intelligence

Figure 1. Re-Coding Post -War Syria/ Socioeconomic Data Analytics. Adapted from: https://www.youtube.com/watch?v=JZygN0Kipl4&t=153s

1 Introduction

Effects of war are widely spread and can be short term or long term, including mass destruction of cities with long lasting effects on a country's economy, and important indirect negative consequences on different aspects such as: infrastructure, public health provision, and social order.

The theoretical approaches of Post-war smart city reconstruction is often fraught with tension between community expectations and professional ambition. The problem in this field, however, is the lack of strategic planning, or more specifically, there is no strategic direction and methodology of how to plan a Post War Smart City considering all aspects of existing socioeconomic and infrastructural data of the targeted areas, especially because most of the strategies don't involve the local community in the rebuilding process. There is a tendency for agencies to underestimate the value of locals' vision of a new city (Calame, 2005).

An example of this strategy is what happened after the civil war in Beirut, Lebanon (1975 to 1990). The urban memory of the historical city centre was completely reshaped and replaced with new post-modern construction without considering the identity of the city, and the local community, their needs and expectations. There were 130,000 people living in the historic city centre from all denominations and all classes of society. After the reconstruction phase, a lot of people could not afford the new modern expensive lifestyle, therefore they moved to other parts of the city. This has affected the diversity of the old city centre, ending up dividing the city and creating class differences.

As the conflict in Syria enters its tenth year, the damage it has taken on Syrians continues to grow mentally and physically, with no promises whatsoever that things will be better, or even that the worst is already behind them. Even if we assume that the conflict is solved, still the daily life they used to live is impaired. The formation of community, environment and infrastructure during the recovery phase of post-war cities in Syria is already precarious, therefore It is necessary to ensure that all members of society are accounted for the new community, as effective members to map the future of post war

128

smart cities, by bridging the gaps between them and the authorities, architects, planners, researchers, builders, to ensure the locals stay in their cities, and rebuild their society, economy and homes (Fig. 2).

Figure 2. Re-Coding Post -War Syria/ Zamalka Town Suburban of Damascus City, damaged buildings. Source: Reparametrize foundation, 2019.

The research of RE-CODING POST WAR SYRIA aims to give a more transparent image of innovating a new methodology to regenerate the future of post-war smart cities into advanced and sustainable urban environments in a smarter way instead of bringing back lifeless structures and shelters to life (Fig. 3). Involving the local communities in the rebuilding process is an important issue, in order to create strategies and data platform that can help professionals, companies and governments to be inspired and envision meaningful and realistic solutions to upgrade urban areas in Syria and the other cities in their redevelopment plans with smart infrastructures, as well as using advanced 3D technologies and socioeconomic data to scan destruction and analyze the existing urban fabric, and data synchronization by using AI driven, to accurately analyze large social and structural data volumes and upgrade the existing infrastructure into smart grid in a very short period of time with limited resources,to support economic development and human well-being, with a focus on affordable and equitable access for all towards a new life again.

Figure 3. RE-CODING POST-WAR SYRIA, When numbers meet Architecture and Culture. Adapted from: https://reparametrize.com/

This paper presents the current status of the Collecting comprehensive, infrastructural and socioeconomic Data of the ongoing research RE-CODING POST WAR SYRIA. This phase consists of two methodologies for Data collection: First, the infrastructural Data and the building status by using the technology of 3D scanning to analyze and document the existing damaged fabric. This methodology was published in 2020 (Archdaily, 2020). Second, the research & documentation of socioeconomic data and the current status of the targeted area by the objective investigations conducted through a series of local and international workshops called 'Re-Coding', which involves the local community to understand their needs and expectations by consequent direct ground surveys, and documentation study to have the statistics of the affected area. The primary focus of this paper is on the second methodology, whereas it implies the importance of creating a framework to merge professionalism and youth power with the local community, to ensure that all members of society are accounted for in the Post-war reconstruction, as effective members in the recovery process of post-war cities.

The presented research aims to create a strategy that acts as a vessel in reviving the destroyed neighborhoods and encouraging inhabitants to come back. A space that respects the past responds to the present and incorporates the possibility of a bright future of Syria.

2   State of the Art

"Only complete destruction can allow a new existence, a new state of things, by preventing evolution and promoting revolution" Syria (Universita iuav di Venezia, 2017).

Today's Smart Global Technology and Artificial Intelligence are enhancing the world to visualize the future of smart cities. Most commonly we hear this term but what is exceptional is the global urban pandemic known as 'War' and our vision to make Post-War Smart City development the new global term.

With the current Global Crisis and Urban Growth Rates, the world is facing growing challenges to reshape the future of cities, such as COVID'19 Crisis; The question is how to Re-Generate the future of post disaster cities? And do cities rebuild exactly as they were? Or do they use disaster as an opportunity to reinvent themselves? (Al Nouri, 2021).

There is a lack of institutions with the ability to comprehensively analyze all of the aspects of post-war affected areas through accurate data gathering, processing and analytics with the ability to simulate the future change of these targeted areas. Therefore, most strategies do not include many of the most glaring, important, and difficult challenges facing the city and many desperate and traumatized residents. Effectiveness of post-war reconstruction depends on the coordinating agent's relationship to the problems, existing fabric analysis and local community.

Therefore, it is necessary to document and analyze the existing fabric ,damaged buildings and socioeconomic data, to re-generate the future of post-war cities into advanced and sustainable urban environments in a smarter way,

instead of bringing lifeless structures and shelters to life, meanwhile preserving the identity of the city and incorporating the existing fabric. Besides, understanding the life struggles of the local citizens and their needs .

"How can we start new strategies to deal with the current situation (Fig.5), how can we give societies hope and convince them that it is possible to re-generate an integrated form based on the basis composite of thought, mind, society, and consequently the building and the structure of the city" (Al Nouri, 2020).

3   Methodology

The presented research aims to create a strategy offering consequent objective investigations, direct ground surveys, statistics and documentation study of the targeted areas (Fig. 4), merging professionalism and youth power with local community to ensure that all members of society are accounted for in the Post-war reconstruction, as effective members in the recovery process of post-war cities ,this strategy will be an open source data used as a tool to re-generate a precarious area towards a new methodology.

The method used in this phase is research & documentation of socioeconomic data and the current status of the targeted area, by the objective investigations and walking around in the postwar district, meeting the local inhabitants, getting an impression of their everyday life, getting an understanding of the site, its characteristics of circulation, social structure and urban fabric.

This method was conducted through a series of local and international workshops called 'Re-Coding', in collaboration with Universities to provide participants with an overview and expertise on the rehabilitation of the post-war areas,and involves the local community to understand their needs and expectations by consequent of collecting data, direct ground surveys, and documentation study to estimate the statistics of the affected area.

This information serves as an important database on which to begin the proposals for post-war Syria. The responsive and dynamic analysis allows us to dissect the temporal tendencies of the strategy,which can help policy makers to make redevelopment plans which does not rely on complete demolition but uses the existing (still useful) urban fabric,resulting in a very cost effective and much more sustainable post war redevelopment ,and learn the advantages and disadvantages from similar situations and strategies followed by other countries that suffered from war.

Figure 4. Destructed areas - Zamalka Town - Suburban of Damascus City. Source: Reparametrize foundation, 2018.

131

3.1. Re-Coding II Rehabilitation Workshop in Al-Ghouta East - 2018

The approach of this workshop is to work on one area that was partly damaged by the war, and later applying this morphology on other areas of Syria.

The workshop methodology implies two aspects: First, building a survey experiment to produce and present analytical data of the local community in the damaged areas affected by the war,understanding their social structure, daily life struggles, needs and expectations. Second, documenting the affected areas and analyzing their characteristics of circulation, social structure, infrastructure, structural situation and urban fabric, by using 3D scanning technology, collecting and sharing data that the students have gathered through mapping destructed regions.This Experience can nevertheless reflect lifestyles and inhabitants and the needs of the local people in every district visited. The selected area for the case study was "Zamalka", a suburb located east of Damascus.

3.1.1 The Ground Survey

The survey targets groups of the local inhabitants with different ages and segments of society: Women, men, elderley, youth and children (Fig. 5). A total of 60 people participated. The survey consists of different questions that cover various aspects of the locals' life: Socioeconomic status, labor rate, wages, education, property ownership, population per house area, … etc. The survey was distributed across Zamalka, by the team of Reparametrize foundation, and students from the university of Damascus.

Figure 5. Consulting and asking the local inhabitants. Source: Reparametrize foundation, 2019.

3.1.1.1 Socioeconomic status

The main insights of this survey experiment suggest that the majority of the inhabitants are women and kids and old men, most of the women are widows and divorcees. Regarding the youth, there is a small percentage of young people. Most of them are migrants, or were killed in the war, another percentage of them serve in the army or have disabilities as a result of war injuries, also there are children in the area in a very large proportion . It was observed that children were permanently present in the streets due to the lack of green spaces and playgrounds (Fig. 6).

(a) (b)

Figure 6. (a): Female labor rate 12%, compared to men 88%. (b): The percentage of working men in different fields. Source: Reparametrize foundation, 2019.

3.1.1.2 Labor status

Most of Women suffer many difficulties in securing daily needs, especially in light of their inability to work and earn a living. Meanwhile, There is a high percentage of working men in different fields: Blacksmith, carpenter and construction workers. This finding indicates the importance of labor programmes for the inhabitants to participate in the reconstruction process through their professions. Integrating inhabitants will play an important role in restoring their sense of identity (Fig. 7).

3.1.1.3 Educational status

The percentage of women in the region whose educational qualifications did not exceed the secondary level are so high.Also the children in the area most of them exercise their right to education within primary and middle schools only, with the absence of a secondary school (Fig. 7).
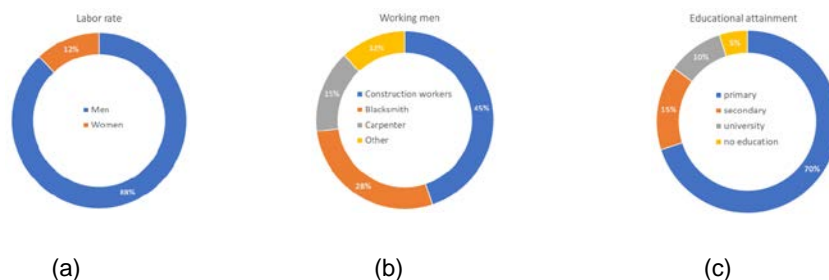

(a) (b) (c)

Figure 7. (a): Female labor rate 12%, compared to men 88%. (b): The percentage of working men in different fields. (c): Educational attainment status. Source: Reparametrize foundation, 2019.

133

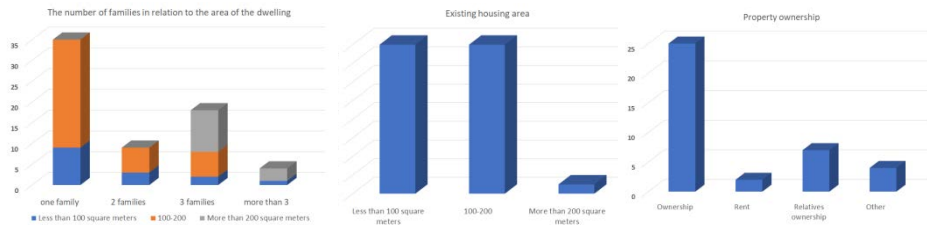### 3.1.1.4 Population per house area & Property ownership

Figure 8. Property ownership & Population per house area. Source: Reparametrize foundation, 2019.

The results indicate that in the same house there is a possibility of two families or even three that are living together due to the lack of houses (Fig. 8).

3.1.2 Documentation

The method used for the documentation in this workshop was modern 3D scanning technology to analyze the existing damaged fabric and understand which areas need reconstruction and which are in useful condition (Fig. 09).
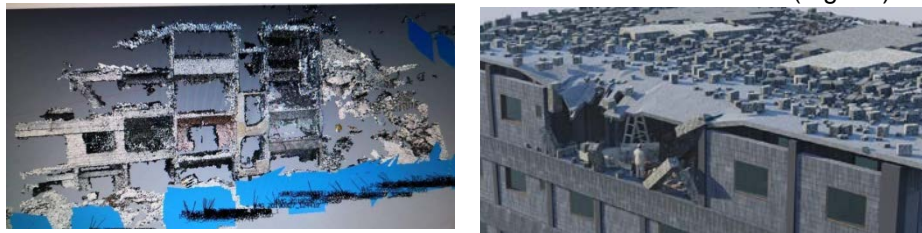
Figure 09. 3D scanning to analyze the damaged buildings. Source: Reparametrize foundation, Human Mkheber, 2019.

3.1.2.1. Service urban current situation

The electricity lines were damaged by the war, especially the high voltage electric line. The municipality installed an emergency electricity network system for the area, the inhabitants keep on expanding it on their own,so that open cables run everywhere and spanned over the street or tightened on housing walls.

Table 1. The amount of damage to various systems and services.

	Water system	Electricity	Sewage System	Communication system	Schools	Suq & Shops
Damage	75%	75%	80%	80%	85%	10%

Source: Reparametrize foundation, 2019.

Besides, 75% of fresh water lines were damaged. As a result of this damage, the inhabitants are relying on alternative, often unsafe water sources (Fig. 10).

134

Regarding the commercial areas and Suqs, the locals after the war opened small shops, including a variety of fresh vegetables and fruits and the basic widgets to cover the need of local residents for daily life. Also the relief organization assists the inhabitants by distributing food baskets. For the education system, all the schools are either damaged or destroyed, while others are being used as collective shelters. An estimation, all children or most of school-age children (aged 5-17 years) are out of school, and a further of them are at risk of dropping out. Currently there is one building that was restored by a funding organization, and they are using it now for all school-ages children (aged 5-12 years), with the absence of secondary school for the older generation. Locals are trying to manage their basic needs for life, despite the difficulties and lack of public transportation, trying to survive, living in the deformation, using basic ways to close the damaged facades, generate electricity by using solar panels, to cover their need and to achieve self-sufficiency.
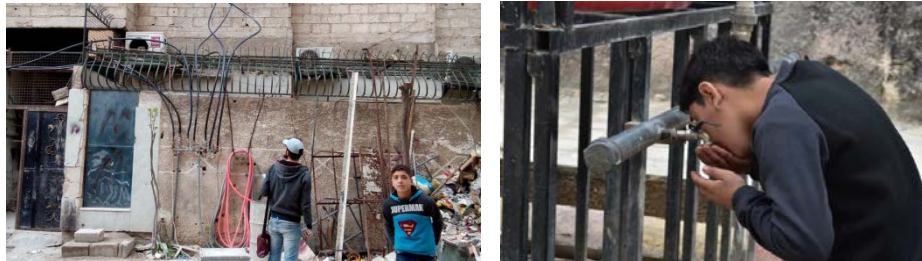

Figure 10. Locals are trying to manage their basic needs for life. Source: Reparametrize foundation, 2019.

3.1.2.2. Structural and Architectural Status

Detected damaged structures are assigned one of four categories: Moderately damaged, Severely damaged, Destroyed, No visible damage. On the other hand,(Fig. 11) a significant number of inhabitants were able or would like to return to their homes, increasing the need to repair and rehabilitate partially damaged houses, and upgrading unfinished buildings and infrastructure to move towards solutions for those who are able to return.

Figure 11. Building destruction rate. Source: reparametrize foundation, 2019.

135

3.1.3. Conclusion

As a result of these studies the data serves as an important tool and guideline to develop post war strategies, considering and analyzing all the aspects: Social and Structural, to meet the needs of the affected community and share their vision for the future post war city. Based on the results of the survey and the documentation, the reconstruction process should include the establishment and expansion of protection services as well as efforts to build the capacity of existing health, water and sanitation ,education service providers and public green space. Beside offering assistance for shelter repairs to encourage the inhabitants that it is possible to re-generate and re-build their homes, society and city.

3.2. Re-Coding III 'RECODING Workshop Beijing' China - 2019

This workshop explores the vision of foreign students to understand the current structural conditions of the destruction, the financial and demographic conditions and come up with a sustainable strategy to regenerate the district of Zamalka neighborhood in Damascus, Syria.the method in this workshop is to develop a case study project. Analyzing the existing fabric and damaged buildings process is based on 3D scanning technology: scanning damaged buildings to understand the current structural condition and develop a reconstruction strategy for the building considering the structural strengthening and the architectural planning.

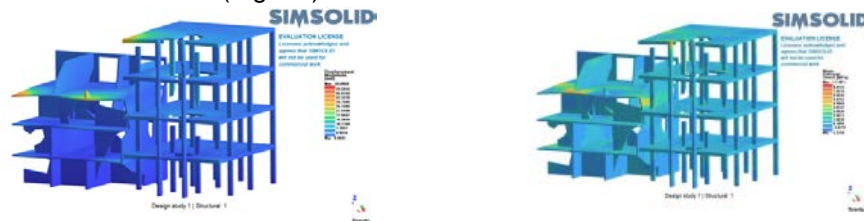This data has contributed to the development of a structural analysis model of the destruction (Fig. 12).

Figure 12. Structural analysis with Altair SimSolid provided by Altair Engineering in order to understand the structural conditions of the semi destroyed case study buildings. Source: reparametrize foundation, 2019.

Results: Growing green plans on the repaired walls to restore the green belt identity of the district of Zamalka (Fig. 13).
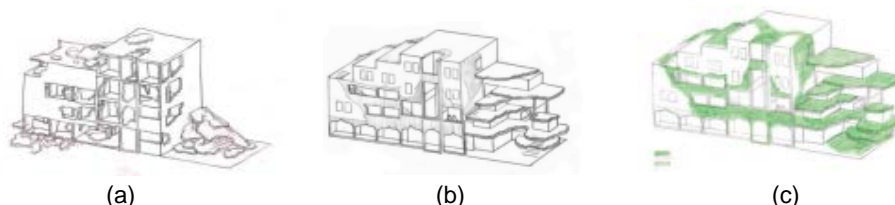

(a)　　　　　　　　(b)　　　　　　　　(c)

Figure 13. Growing green plans on the repaired walls. (a): Destroyed Condition. (b): Repaired Condition. (c): Regenerated Condition. Source: reparametrize foundation, 2019.

Development of multifunctional usage strategy of the architectural planning of the building where multifunctional communal spaces, offices and living areas intertwine. The living quarters and offices are also designed to be adaptable to different family and working conditions with abilities to join small apartments or offices in the same floor space into bigger ones.

Threats: The District of Zamalka has relatively light damages from the war (about 20% to 40% destruction on average), compared to other districts where the destruction is more than 80%. Following this the district has been designated as a place for renovation and not total reconstruction. This, however, makes the district an unlikely target for immediate investment. In areas where the destruction is big, large investments can happen easily since the focus is to clear the debris and develop a new urban plan from scratch. In Zamalka where the buildings have been owned by multiple owners and the damages are relatively small, there are too many interests intertwined and it is hard to convince a large investor to make a commitment to redevelop the area.

3.3 Re-Coding V 'Echo of Children' course - 2020

This Course focuses on Re-thinking the methodologies and results of temporary architecture practices in affected environments. An essential part of the course was the design inspired by the vision of children who gave students ideas through their beautiful colors and sketches which expressed their needs of space for playing and communication. Besides, optimizing students' knowledge about reusing materials as essential means for current views of post-war reconstruction. The research scoped local materials in Syria and material innovations and development trends, from advanced High-Tech to Low-Tech basic approaches.

The selected area for the case study was Al Zabadani Town, suburban Damascus, the method is to meet the children there (ages between 7 and 9 years old) that their educational progress was interrupted and their life has been surrounded with rubble and a lot of unidentified thoughts of their future. This workshop reflected a considerable interaction of the children and their talent in art work on pictures of destruction (Fig. 14). They expressed their need for a social place where they can play with their friends, learn and do activities together with their families. Students considered the vision of children as the main core concept for their prototypes.

The children of Zabadani draw their vision of the place: communal space to play and nature are the primary elements for them.

Figure 14. Echo of children course, children's drawings. Source: reparametrize foundation, 2020.

Results: An example of developed 1:1 functional prototype, designed by students as a result of the cumulative phases of the course, considering the structural approach, new material interventions, data gathering and the vision of the children (Fig. 15).

Figure 15. Echo of children course, 1:1 prototype. Source: reparametrize foundation, A.Daaboul, J.Wechtenbruch, L.Birwe, 2020.

The presented strategy offers an inclusive and accessible community area, inviting different ages and mainly children to enjoy together. In response to the children's need, the human scale was included, beside generating complex buildings that inspire and address the senses. This organic design approach creates a feeling of shelter and safety. This is supported by the combination of clay and glass as a solid and yet translucent material (Fig. 3), that creates an atmospheric place. In contrast to the heavy clay structure which is used for closed spaces, very light elements were added for the outside spaces.

Conclusion: Significant post war redevelopment tends to come into action very rapidly leaving behind children as their presence seems to be overlooked and underappreciated, while children are the most important life vein in such destroyed communities. Social post war recovery should start with children as the main aspect and help them to express, imagine and play not on rubble, but in new spaces they have imagined and turn it into reality.

3.4. Re-Coding 'Damascus Dialogues Course' Vienna - 2021

The research investigates new ways in which architecture can participate in community building in a post-war urban context. The main question is: If spatial interventions at a small scale, strategically dispersed, can instigate community building? By occupying the fabric of the existing building in various states of desolation and destruction, the interventions connect a network of public rooms that attempt to bring communal life back to the street. The research includes a set of objective investigations consisting of three main topics: Urbanism & Public places, Ecology and Matter. The primary focus is, using the neighborhood of Zamalka as a prototypical site for the project and, potentially, for an extended study. Each of the three studies seeks to find and design its own methodology, where there is a set of tools and distinctive inputs for each research, which in turn leads to a set of various outputs: Visual, Cartographic, Photographic, Models, Audio …etc.

3.4.1. Urbanism & Public places:

The methodology of this topic is based on the principle of zoom (in _out) as camera holder (eyes in move), where it deals with urbanism and public places by tracing the path of the journey on foot in Damascus and its suburban, in an attempt to read the city and document the typology of the neighborhoods. Three types of neighborhoods were classified: formal, informal and mixed. The study for each region starts from the aerial maps moving to a more detailed scale, analyzing the public spaces, the population and their interactions together.

The journey starts from a public place, which was the park, to another public place (the bakery), passing by the souk. During the journey, many innovative dialogues questionnaires were conducted with the residents. Sound, image and built environment were fully experimented and resulted in collections of storyboards (Fig. 16). Then the study moved to an attempt to read the city in the way of maps which resulted from observation, experimentation and testing, thus, transferring the sensual experience to the viewer.
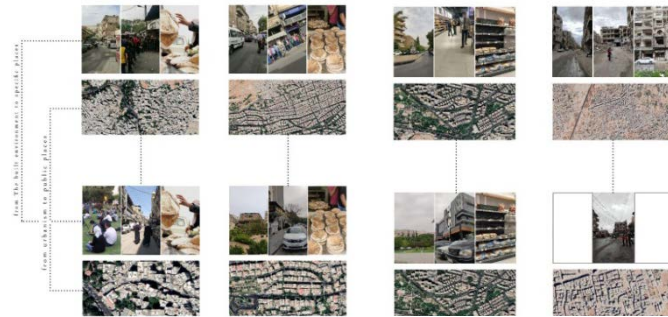
Figure 16. The journey experience presented in a collection of storyboards. Source: reparametrize foundation,a[FA], Sedrah Alayoubi, Adriana Bock 2021.

Through the interactive cognitive maps, the target was to learn about the areas and their interest, what happens within the built environment and how do people interact with it even in Damascus city which was partly affected by the war as well as in the eastern Ghouta which was totally affected by the war. A type of map was selected: Interactions between the user and the urban context, user behavior in place. The maps show what people want to do and what is already there.

3.4.2. Ecology:

This topic examines the ecological elements and their impact on the urban context of the studied area: zamalka - Damascene countryside. The goal is to investigate the details of the rural area and its environmental components that suffer from the effects of war and economic siege, towards developing a new post-war strategy: Self-healing nature.

A questionnaire (participatory study) was built aims to make the inhabitant responsible for integrating the ecological elements into his own environment (his private place) according to his desires and imaginations of the place and environment, so he arranges the following elements in a virtual space similar

to his tangible environment which is: Water sources, sitting and gathering places, urban furniture, plants and trees, non-domesticated animals and places of activities such as sports ... etc.

It was applied in the countryside of Vienna _ Aspern _ and then in the countryside of Damascus _ Zamalka.

The questionnaire was linked to the typology of the place. In Vienna, it assumes the inner courtyard between a group of buildings, the place of the test, while in Zamalka, it is a public square open up to the street (Fig. 17).The participatory study produced many patterns and models that were entered into different engineering software to obtain a three-dimensional visualization of modeling the personal paradise for each individual, and thus studying the possibilities and representing the ecological elements in a three-dimensional imagination that simulates reality, which in turn helped to understand and read the difference between the current population trend and the desires of the population in dealing with the ecological in their area.
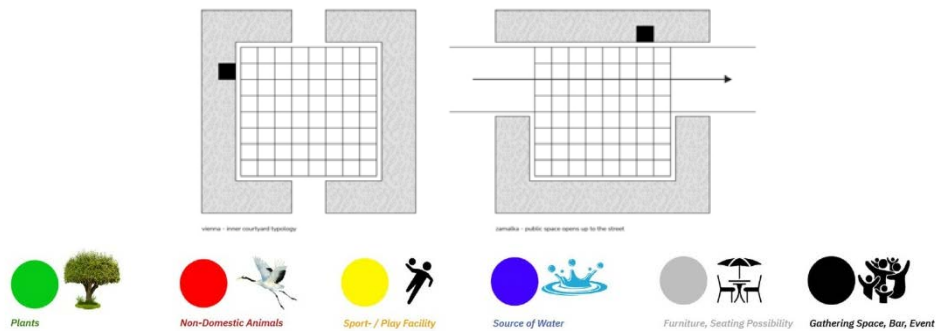
Figure 17. Virtual space similar to the tangible environment. Source: reparametrize foundation, a[FA], Carmen Egger, Muaz Shbat, 2021.

Figure 18. Dimensional visualization of modeling the personal paradise for each individual. Source: reparametrize foundation, a[FA], Carmen Egger, Muaz Shbat, 2021.

As a result of this study: improving the ecological reality can start from spatial interventions with simple acupuncture on a number of yards and spaces in rural

areas that were affected by the war, such as Zamalka. Therefore, the topic has chosen potential areas for new yards in Zamalka and proposed the introduction of the concept of vertical cultivation on them to support and restore farming, and it searched for the reasons that contribute to the decline of agriculture, such as the high costs of agriculture, the high wages of workers and the irrigation wages, etc., then ,it tried to find solutions to them.

3.4.3. Matter:
The starting point of reading/studying the matter comes from the topic of entering a digital turn with application of machine vision, constantly using cameras, scanners, 360 stereo to study the material and teach computers to read the material. This topic is based on a large group images taken from Google Map and urban scenes taken from the city of Damascus (during the visit of the places) and inserted into the machine To study the city through the point of view and perception of the machine compared to the point of view and perception of humans (physical vs. digital) .The matter began to focus more on the architectural elements, five architectural elements were selected through image segmentation method. These elements were stripped from the city (cropped and made into single elements) and then entered into the machine to be subjected to the test which are: the fountain, the door, the balcony, the muqarnas, and the window. One architectural element was chosen to focus on it, which is the balcony. The data of the balcony (the study element) was collected and its locations and patterns were monitored in the city of Damascus, the Shaalan and Old Damascus regions, and maps were made on them showing the density of their presence. The study moved from Damascus to Damascus Countryside (Zamalka) And the data for the balcony was entered into the machine to help answer the question "How can we apply the models of balconies in Damascus to zamalka's balcony and work on the principle (from micro to macro)? How can the concept of an architectural element be transferred from Damascus to the countryside?

A new optimization merging identity, material and spatial value was applied to an existing balcony using a style image which gave a new induction to the matter and enhanced the form and function of the new post-war balcony form. The result was obtained from several images taken from Damascus and grouped together in a scripting way.
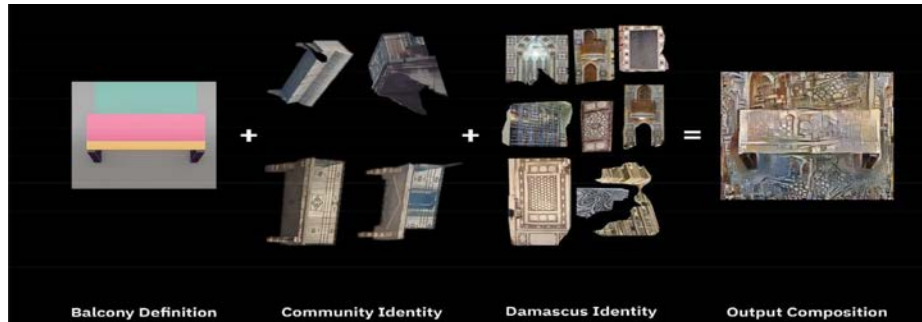
Figure 19. Analyzing the existing buildings and their current situation using machine learning technology, Matter. Source: reparametrize foundation, a[FA], Sara Faraon, Chein Shen Hua Huang, 2021.

The balcony was divided into three sections that have the ability to adapt and form multiple levels of privacy and functions and interact in terms with inhabitants as a new façade system applied to destructed buildings.

Ultimately, using the data/camera as a starting point to investigate the potentially neglected facts of what can be analyzed, moreover, what cultural and social aspects can be analyzed through the lens provided by which can socially inform us more than materiality. This leads to main questions: Can a new form of prototypical design of Balcony add spatial qualities to the community? How can machine outputs be processed to reach a participatory case for an affected community?

3.4.4. Conclusion

The intervention of these aspects can serve as a backbone for a future comprehensive data platform that aims to a new optimization of reconstruction strategies for the city of Damascus and it's countryside, towards a recovery process from the effects of war. These interventions may be qualitatively small, but they have a noticeable impact, as they seek to improve the society, the environment, and public spaces, thus, forming new rules based on new methods in order to contribute to changing the reality of post-war areas with few and many rates of damage and destruction.

4   Conclusion

The research presented in this paper aims to form a wide vision regarding Post-War Smart City's development, and give a more transparent image of innovating a new methodology to regenerate the post-war smart cities, by unifying mind and working hands, local community, using consequent objective investigations, direct ground surveys, statistics and documentation study of the targeted areas, and using renowned ways instead of ordinary rebuilding practice, to encourage refugees to return and rebuild their society, economy

and homes. This strategy will be an open source data used as a tool to re-generate a precarious area towards a new methodology.

The attitude and core value of the research is raising the ability to detect and document various parameters, physical: structures, their condition and operational capacity, as well as emotional: human behavior, expectations and their needs, to re-generate the city in a smarter way instead of bringing back lifeless structure and shelters to life. This attitude allows the cities to remain flexible and to absorb various cultural and technological shifts, and introduce advanced solutions addressing these contemporary challenges that are capable to re-generate a new built environment that explores the advancements of innovative technologies and planning, redefining local community and natural habitats. envisioning Systems that can form a Vital Core to support divested neighborhoods resulting in a very cost effective and much more sustainable post-war redevelopment which can be applied repetitively and integrate with time and people.

The ultimate goal is to achieve well-articulated and non-bias research, to share the gathering data, and to develop strategies that will be disclosed as open source data in order to envision meaningful and realistic solutions for post war Syria, and other similar problems in different parts of the world

Ayoubi , Walaa Al Khatib , Muaz Shubat , Sara Faraon , Loujain Al Wadi ,Hazem Kuradli ,Adriana Bock , Chien Hua Huang ,Carmen Egger ,Zack Beale , Tala Saouma)

References

Calame, J. (2005). Post-war reconstruction: concerns, models and approaches. *Macro Center Working Papers*, 20.

Soufan, A. (2016). Historiographical overview on the post conflict reconstruction in Syria: From the mid-19th century to the 2011 crisis. *UNESCO,* 31.

Geipel, R. (2012). *Long-term consequences of disasters: The reconstruction of Friuli, Italy, in its international context, 1976–1988.* Springer Science & Business Media.

Carbonnier, G. (1998). Conflict, postwar rebuilding and the economy: a critical review of literature.

Al Nouri, M. (2021, January 15). Recoding Post War Syria. London Design Biennale. https://www.londondesignbiennale.com/reparametrize-studio

Round City Staff (2021, January 11). Reparametrize Studio on using AI for Syria's post-war reconstruction. *Round City.* https://round-city.com/interview-reparametrize-studio-on-using-ai-for-syrias-post-war-reconstruction/.

Harrouk, C. (2020, February 4). Reparametrize Studio and Digital Architects Re-Code Post War Syria. *Archdaily.* https://www.archdaily.com/933147/reparametrize-studio-and-digital-architects-re-code-post-war-syria?ad_source=search&ad_medium=search_result_all.

Harrouk, C. (2020, May 11). The Fundamental Role of AI in Current Post-War Reconstruction.*Archdaily.* https://www.archdaily.com/938705/the-fundamental-role-of-ai-in-current-post-war-reconstruction?ad_source=search&ad_medium=search_result_all.

Myers, L. (2020, January 21). Re-coding post-war Syria' uses 3D scanning to map the future of Damascus. *designboom.* https://www.designboom.com/architecture/re-coding-post-war-syria-redevelopment-of-damascus-01-21-2020/

Azzouz, A. (2017, March 14). Rebuilding Homs: how to resurrect a city after years of conflict. *The Conversation.* https://theconversation.com/rebuilding-homs-how-to-resurrect-a-city-after-years-of-conflict-74629?fbclid=IwAR38mH3smG6eL17kAUpO6t4bjQ9e6TmfWOGPDmlspkzPUTdan2k_Pbj9g6s

Aleksić, A. (2020, February 12). Digital reconstruction of destroyed Syrian cities. *GRADNJA Digital Magazine.*
https://www.gradnja.rs/digitalna-rekonstrukcija-porusenih-sirijskih-gradova/.

Reparametrize Studio. (2020, January 8). "Recoding Post War Syria " at Bi-City Biennale of Urbanism\Architecture in Shenzhen - China [Video]. YouTube.
https://www.youtube.com/watch?v=IsSNkiTgZZU&t=341s

Reparametrize Studio. (2020, April 30). "Recoding Post War Syria " [Video]. YouTube.
https://www.youtube.com/watch?v=JZygN0Kipl4

Reparametrize. (2021). Recoding Post-War Syria. The Reparametrize Studio.
http://reparametrize.com/project/recoding-post-war-syria/

145