WASTE FROM AN ARCHITECTURAL PERSPECTIVE AS A WAY TOWARDS QUALITY OF LIFE

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ABSTRACT

Because of economic and social development witnessed over the recent years, new lifestyles have emerged in response to human growing and changing needs. Consequently, waste amounts increased abundantly with different sorts of waste materials. Thus, following scientific methods to develop waste management (including collection, transport, storage, dumping of waste in a proper manner) has become a pressing necessity. This study examines the possibility of waste management, from an architectural perspective, and its role in raising the quality of life indicators. The study discusses this topic at two Themes; firstly, it presents a theoretical background of the quality of life, its indicators and how it is related to architecture and waste management. Secondly, it examines how applications of waste management can be useful in architecture. Finally, the study focuses on using those applications to develop smart, sustainable and environmental architectural design, as well as the hierarchy of waste management applications, starting from designing interior spaces to planning large cities.

KEYWORDS: Waste, Quality of life, Domains, Indicators, Architecture, Building construction.

1. INTRODUCTION

Over the recent years, there has been an increasing interest about life quality, its related issues and how they are tackled by world organizations. Studies in this area focus on life quality because it covers various research interests, including sociology, psychology, geography, economics, history, medicine, architecture, transport, income, employment, society and environmental issues. So, quality of life studies have been considered as a response to many problems facing new towns all over the world as well as in Egypt.

1.1 The Problem

One aspect of any developed country is that it cares for meeting the basic needs of its citizens. Thus, over the two recent decades, developed countries paid special attention to economic growth by creating "quality of life indicators" like financial markets' indicators. However, waste serves as a barrier to developing this progress due to its direct and indirect impacts on all aspects of human quality of life.

1.2 Objectives

This study aims to identify quality of life indicators in addition to identifying the types of waste and the methods of waste management. It also focuses on the possibility of applying those methods to architecture and building constructions in order to achieve the Zero Waste Architecture, Zero Waste cities and then a better quality of life. This can be made feasible by applying the principles of waste management at the levels of interior design stage space, constructional space, building designs, and city planning as a whole.

1.3 Methodology

In order to achieve the objectives, this study followed two approaches as a methodological background. Firstly, it has adopted a descriptive analytical approach to analyze the quality of life indicators and to find how they are related to the waste management and architectural design. Secondly, it used an analytical inductive approach to study the possibility of applying waste management hierarchy to the building construction, architectural space, urban and regional planning. The management of waste from an architectural perspective becomes a tool for creativity and rising indicators in quality of life.

2. QUALITY OF LIFE

2.1 Definition

The term 'quality of life' can be defined as a concept that refers to the state of satisfaction of life, prosperity, or happiness that an individual or a group of individuals would have with regard to the life basic requirements. Generally speaking, quality of life measures assume that there is a direct relation between the ratio of economic growth and the state of satisfaction. However, there is no unanimously agreed upon definition of the term 'quality of life'. The concept rather covers qualitative and quantitative standards at individual level and the society as a whole. Qualitative standards at individual level measure his/her feeling of satisfaction and happiness with life conditions. More broadly, qualitative standards

at society level measure individuals' ability to participate actively into their society and to what extent they are associated with it.

Quantitative standards for an individual focus on measuring his/her educational qualifications, his/her skill. However, quantitative standards at society level measure the quality of environmental and economic conditions.

Thus, when waste affects historical buildings such as it is the case of Saray Hotel, a governmental building that dates back to the time of Ottoman state, located in Al-Rashid St. in Baghdad, Iraq[Al Arabiya,2013], it has a negative impact which extends to health, tourism, employment, economy, environment as well as other security sectors. The same fact applies to the Garbage City, at the foot of the Mokattam Mountains in Egypt [Regine, 2014]. It also undermines our vital resources, as it is the case of the Nile River, which is being polluted on a daily basis due to the dumping of garbage, dead animals and more in its water. No doubt, that loosing grip on the Nile will lead to water scarcity, which could endanger the country's stability and its regional dominance [Dakkak, A., 2014] (Fig. 1).

A historical building - Baghdad | Garbage city, Cairo | Nile pollution, Egypt

Fig.1. Impact of waste on vital aspects of our life such as environment and economy, which in the end affects the quality of life. Source: [Al Arabiya, 2013], [Regine, 2014] & [Dakkak, A., 2014].

2.2 Quality of Life Indicators

The quality of life has main four basic parameters, namely economic, social, environmental, and architectural domains. These domains have sub-sections and objectives covering all other aspects of the quality of life. The elements listed under these sub-sections are called indicators. An indicator serves to provide all details about the quality of life with relevance to specific domains for which that indicator is used as a measuring tool.

In this way, quality of life indicators can be viewed as a method to evaluate/measure the effectiveness of the society as a whole. However, when we examine these indicators separately, they give us useful information of partial issues in the society, thus we can have a global picture of the quality of life.

The quality of life can have different meanings in response to the relevant parties in the society such as the dwellers of the city, businessmen, or even foreign visitors. Some may interpret the quality of life in terms of an enhanced state of

security, job opportunities, clean and healthy environments, easy travelling, and availability of services, good healthcare, modern schools, active government, or social solidarity.

For this reason, there are many bodies to categorize and update quality of life indicators on an annual basis. Examples of those bodies include but are not limited to Jacksonville Community Council Inc (JCCI), Citizens Building Better Communities[issuu.com,2013], Organization for Economic Cooperation and Development (OECD) [OECD,2013], Economist Intelligence Unit[Economist,2005], Numbeo (the world's largest database)[numbeo,2014], and International Living Magazine.

2.3 Egypt's International Quality of Life Ranking

Egypt ranked the 80th position out of 111 countries in the Quality of Life Index for 2005. It also has 5.6 out of 10 points according to The Economist (a specialized newspaper in the economic affairs of world countries) [maghress.com]. According to the Mercer 2012 Quality of Living Survey, Cairo was in 95th place out of 221 cities [hr.com,2012]. According to Numbeo's Quality of Life Index by Country for 2012, Egypt was in 49th place out of 51 countries. In 2014, Egypt was in the 65th out of 68 countries [numbeo, 2014].According to 2011 Report on the Quality of Life Index which encompasses 137 countries; Egypt was in the 85th place [nationranking.wordpress.com, 2011].

2.4 Quality of Life: Architecture and Waste

Although there are various indicators adopted by many organizations to measure the quality of life, yet all those indicators focus primarily on economic, social, environmental and urban factors. These factors have both direct and indirect impact on architecture and could have a positive or a negative effect on the quality of life. Likewise, waste could have either a direct or indirect impact on the quality of life. However, waste itself as an existing phenomenon could have an adverse impact on the quality of life indicator. This study assumes that architectural design and trends can affect waste management so as to create a positive quality of life indicator (Fig. 2).

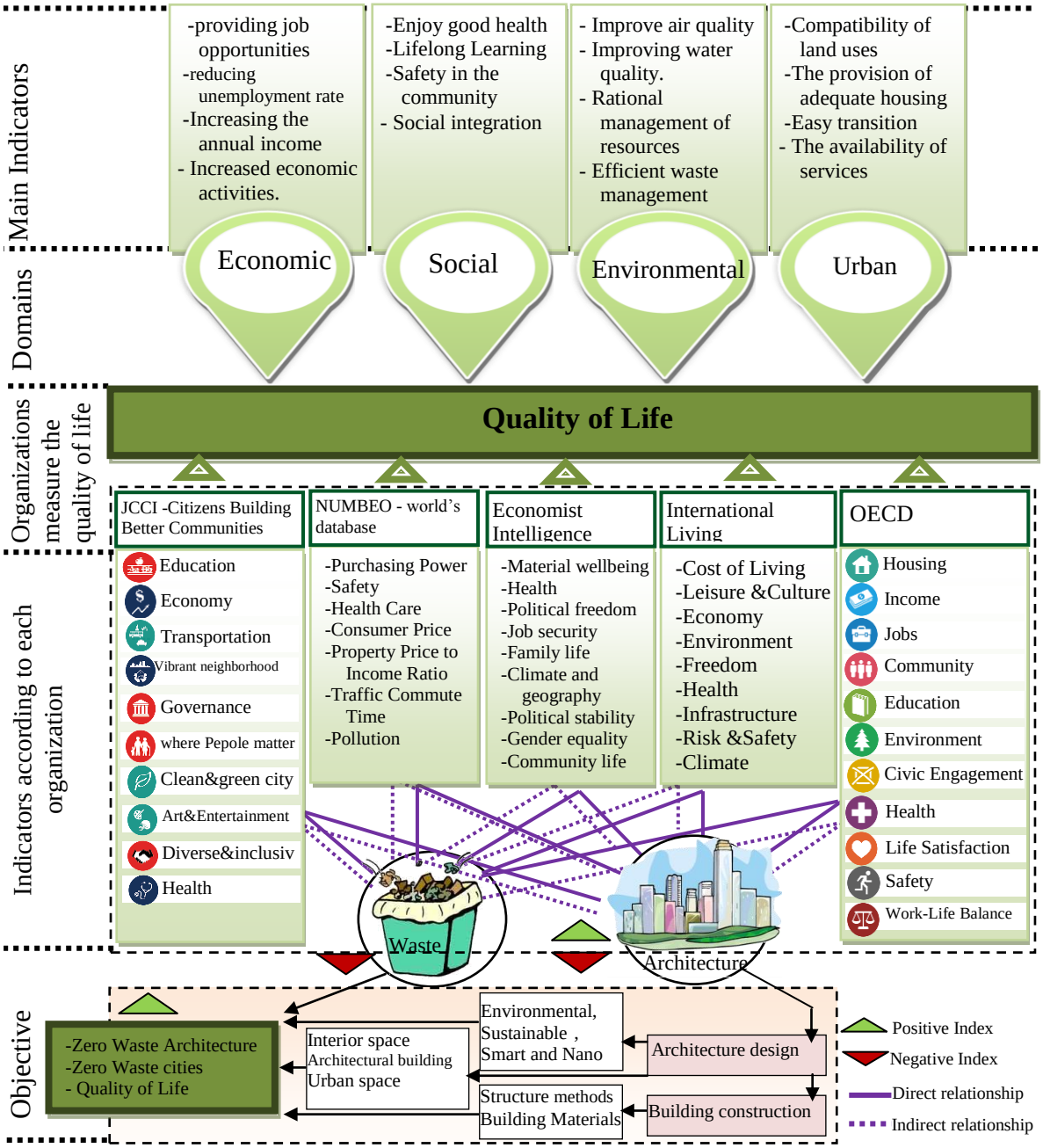


Fig. 2.The relationship between Quality of life indictors and both waste and architecture. Source: Author, based on [issuu.com], [OECD, 2014], [Economist, 2005] & [numbeo, 2014].

3. WASTE

Waste is a concrete term which refers to the unwanted materials that come out as a result of people's household, agricultural, industrial and producing activities. In other words, it means all unwanted, movable material that is left out there at any place, and if not managed properly, could threaten health and public safety.

3.1 Types of Waste

Waste has many classifications; it has two types based on the degree of its hazardousness. For example, there is mild and hazardous waste. There is also liquid, gas, and solid waste. However, it could be classified with reference to its source. So, there can be domestic waste, shopping waste, industrial waste, agricultural waste, medical waste, and construction and deconstruction waste.

3.2 Waste Management Principles

Waste management methods vary from Reduction, Reuse, Recycling, Recovery, and the use of Landfill.

A good example of waste **Reduction** is the strategy adopted by San Francisco as they have recently distributed fancy new clothing donation bins in order to divert textile waste from landfills. According to Fast Coexist, 39 million pounds of textiles end up in landfills. It is tricky to recycle clothes. A company uses 400 different criteria to sort through the waste alone. For the new textile bins, Frog threw out the old dumpster, the lid opens with an easy "smile-like" lip. Each bin is equipped with interior sensors that signal trucks when it is time for a pickup [Lee, K., 2014].

Another example that highlights the effectiveness of waste **Reuse** is the 'Shwopping' campaign launched by the UK retailer Marks & Spencer (a portmanteau of 'shopping' and 'swapping') to collect unwanted clothes. The campaign calls attention to clothing waste in a way that temporarily has transformed an urban setting in London. Covering the outside of a four stories building, the garments were taken to Oxfam where they could be resold or recycled [Stephanie, 2012]. Waste reuse also is similar to rainwater saving strategy, when rain barrels become a great way to save water and money. Collecting and re-using rainwater from gutters and downspouts for gardens minimizes the amount of water flowing into storm drains [socalwatersmart.com].

Waste **Recycling** is also a wide spread practice in many countries. For instance, the chinese have been able to develop a very intelligent recycling machine in the Beijing Subway, China, 2012. The machine can convert the waste bottles into corresponding money to recharge users' Public Transport One Cards. Bottles are crushed to a third of its original size [Xinhua, 2012] (Fig. 3).

Textile Donation bins, San Francisco | 'Shwopping' campaign UK, Marks & Spencer | Collecting and re-using rainwater | Intelligent recycling machine, converting waste into corresponding money

Fig . 3. Using waste management to create economic, social and environmental solutions for improving quality of life. Source: [Lee, K., 2014], [Stephanie, 2012], [socalwatersmart.com] & [Xinhua, 2012].

Waste **Recovery** is another great solution of waste management. An example of waste recovery is the process of Energy-from-Waste (EFW) which generates energy in the form of electricity/heat from the incineration of waste. It is considered an optimal solution for cities that have no available space for waste dumps and where transport cost is very expensive. It also saves energy natural resources.

Another way of waste management is 'Landfill', which refers to the process used for the disposal of waste materials by burial and is the oldest form of waste treatment. In this process, a big hole is dug deep into the ground, treated and insulated from underground water then waste is dumped down and covered with sand. Landfill sites can be used later for farming or to be special areas for the incineration of waste (Fig.4).

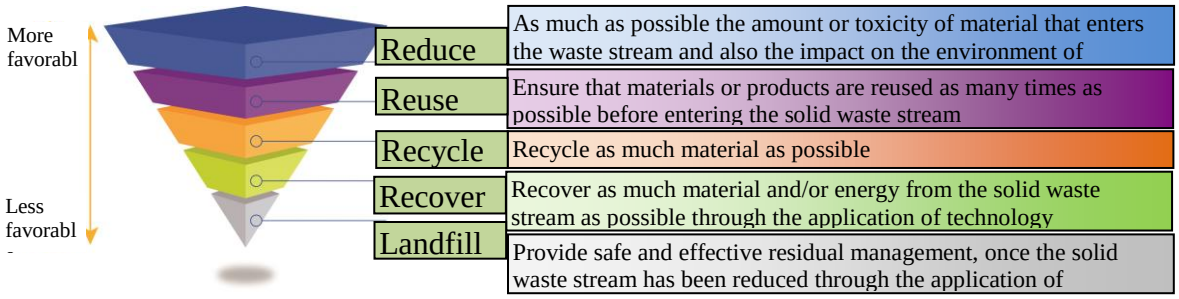


Fig.4. Hierarchy of waste management principles. Source: Author.

4. WASTE MANAGEMENT PRINCIPLES AND ARCHITECTURE

In this part, the study looks at waste management from architectural perspective. It examines available alternatives based on waste to be considered during the designing process of trends as environmental, technological, or digital ones. It also attempts to investigate the construction methods and building materials based on waste management solutions, with particular attention to interior space,

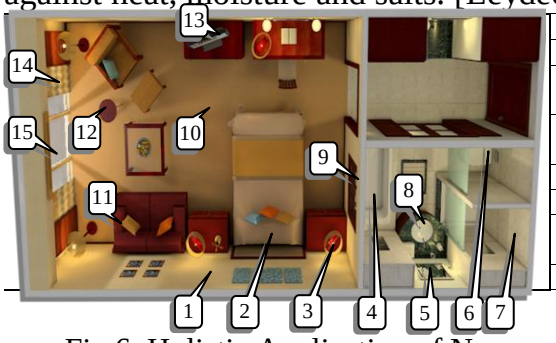
building, urban space and planning of the whole city. Study an effect of these applications on main indicators of quality of life

4. 1 Interior Space

Contemporary examples like, smart designing systems can be used as solutions for waste management as in the mobile Illy Push Button House in the United States and Italy made in 2007. The house was designed within the frame of a shipping container, recycled to be a permanent house. Information and Communication Technology (ICT) was used along with steel cable networks to enable remote control of the house. The house door and windows can open within 90 seconds and its facilities such as electricity, water and sewerage were remotely controlled. Steel wire connections were fixed within the body of the container in a very controlled way [VCUQ, 2010] (Fig.5).

Fig.5. Recycling a shipping container by using smart systems. Source: [VCUQ, 2010].

Waste can be reduced in the interior space through the applications of nanotechnology. Thus, we can get building materials to purify outside air, materials with photocatalytic self-cleaning properties, and insulating paints with resistance against heat, moisture and salts. [Leydecker, S., 2008] (Fig. 6).



1	Wall Paint	Air-purifying	9	Frosted Glass	Anti-fingerprints
2	Bedding	Anti-bacterial	10	Carpet	Air-purifying
3	Light Switches	Anti-bacterial, non-stick	11	Upholstery	Air-purifying
4	Bathtub& Shower Screen	Easy to clean ,non-stick	12	Glass Table	Anti-fingerprints
5	Mirror	Anti-fogging	13	TV	Anti-reflective
6	W.C	Easy to clean	14	Curtains	Air-purifying
7	Walls	Nanoparticles ceramic covering	15	Window	Self-cleaning photocatalytic or electrochromic
8	Sanitary ware	Anti-fingerprints			

Fig.6. Holistic Application of Nano surfaces in Interiors. Source: Author based on [Leydecker, S., 2008], [3dimex.com].

-Waste management principles and architecture: in first case, principle of recycle with smart architecture. Completely creative solution for save space but it is not economic to all. Another case used principle of reduce with Nano architecture. It uses creative material to reduce waste and pollution. It also is an uneconomic solution in the short term.

- Impact on main indicators of quality of life: It has positive index in Environmental domain, indirect effect with social and urban domains; finally, it will get a positive index in economic domain on the long run.

4.2 Building Design

Sometimes the designing idea can be simply based on recycling waste materials as in "The Seeds of Life Skyscraper" designed by Osama Mohamed Elghannam and others in Egypt. Mekano Studio has recently received an honorable mention in the eVolo 2011 skyscraper competition. The idea behind this proposal is to recycle the city's waste and use it as building material for large-scale development that could eventually become a city in itself. "Mekano" is composed of an exoskeleton where different types of living and working units could be plugged-in. Hundreds of terraces are used for agriculture and rainwater collection, while specific sites are used to bury organic waste and produce biogas, electricity, and fertilizers. Pre-fabricated modular homes will serve as conduits for biogas, water and electricity. Moreover, they will serve as "wind-stalks" that can harvest wind power as energy [Aiello, C., 2011] (Fig. 7).

Fig. 7. "Mekano" Recycle city's waste in Cairo. Source: [Aiello, C., 2011].

Another example is Hive-Inn™ City Farm at New York, US. The city has been designed by Hong Kong-based OVA in 2014. It is a modular structure where containers are designed and used as farming modules and act as an ecosystem where each unit plays a role in producing food, harvesting energy, recycling waste and water. The idea of this ecosystem is to bring farming down-town and grow fresh produce near their urban consumers. Containers can be owned or rented by major brands or even serve as private local gardens. They can also serve educational purposes for the neighboring schools. Containers can be taken out, plugged-in or replaced to switch usage from farming to hotel rooms, service apartments and offices [www.ovastudio.com] (Fig. 8).

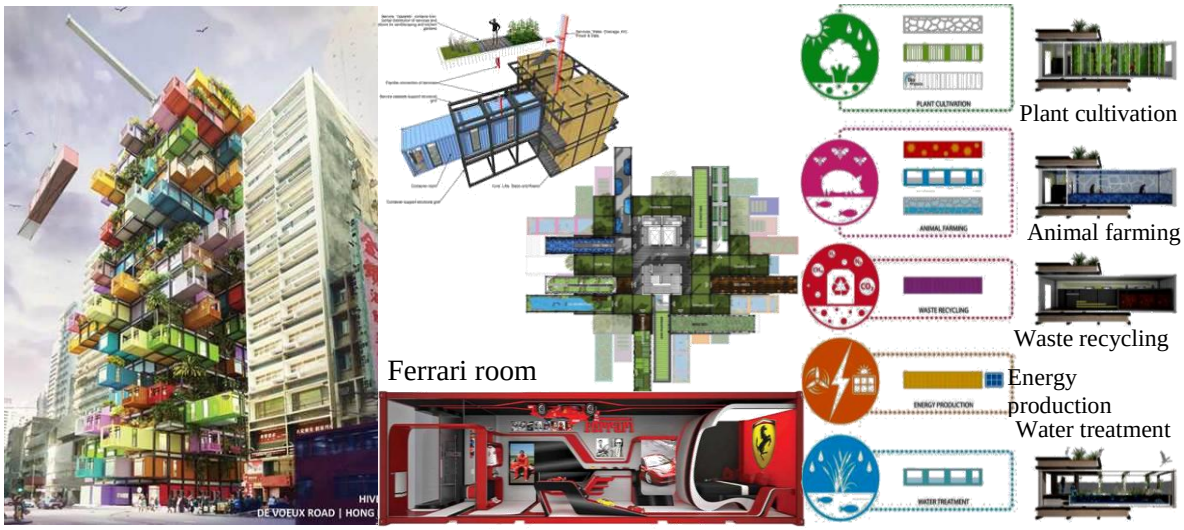


Fig.8. Hive-Inn™ City Farm with its main components, container types, exterior structures for advertising. Source: [www.ovastudio.com]

- Waste management principles and architecture: the two cases used almost all principles of waste management, sustainable architecture, and creative structure methods.

- Impact on main indicators of quality of life: two cases designed to be zero waste architecture, so, they have positive effect in main domains of quality of life.

4.3 Urban Space

Urban design too has a vital role in spreading awareness of waste management. For example, in Madrid a new hotel called Trash Beach Hotel was opened recently. The hotel was designed by German architect Hans-Jurgen Schult. The building was built entirely of waste from landfills and beaches in Europe, a project of Save the Beach, hosted by Mexico's Corona brand .Total construction of the hotel took 12 tons of waste, with 5 rooms in the hotel. As a result of competition for the project page on the social network Facebook, the committee has selected a few winners, after spending the night in a garbage room they shared their impressions. According to the authors of the project, the Trash Beach Hotel is a model of the world where people come just for a while, and do not care about what will come after them [timetorilex.wordpress.com]. In Paris, at the space of the Centquatre at the Halle d'Aubervilliers, a creative Wavy Waste Landscape Installation has been made of 65,000 used CDs to count for another great example for the creative ideas used in this area of waste management [oddstufflab.com].

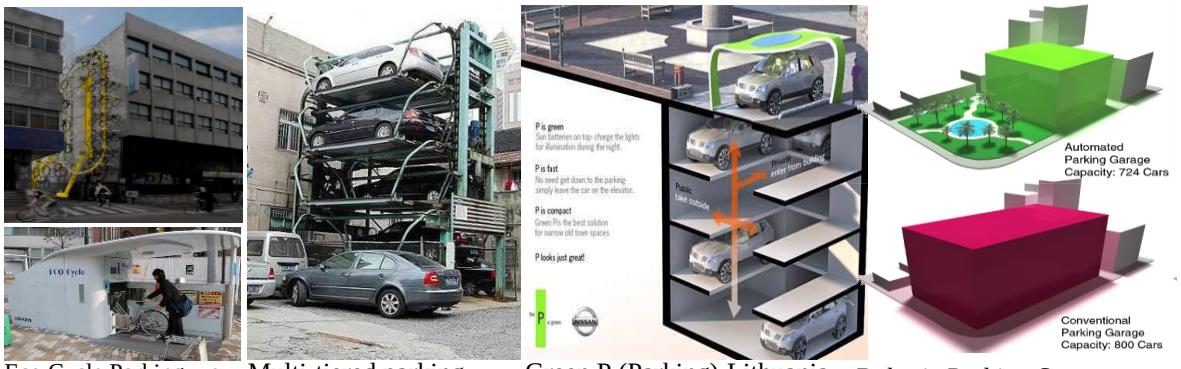
Urban design also takes into account the optimal use of area. For instance, Zhuzhou city, in China, has built a complex on top of a shopping mall. For that, they have built four villas with gardens. They made a good use of real-estate management by used to house the mall's 160 employees [Effron, H., 2012] (Fig. 9).

Trash Beach Hotel, Madrid Waste Landscape, Paris Built on top of a mall, Chinese

Fig. 9. Urban design has a vital role in spreading awareness of waste management. Source: [timetorilex.wordpress.com], [oddstufflab.com] & [Effron, H., 2012].

Parking is one of the thorny problems arising from architectural designs as it causes pollution, waste space, time and money. Perhaps Robotic Parking Systems is the solution. They do not only ensure to use 50% less land area for the same amount of parking, but also these offer more security, less emissions and greater convenience for users, particularly with high-speed efficiency and fast retrieval times. Developers gain more revenue generating space. Or, the space saved can be used for green space and open areas to help meet LEED standards [roboticparking.com]. The P parking is green by algis berziunas from Lithuania, at 2009. Green P (Parking) easily fills still unused urban spaces like spaces under over roads and new design bridges. The system also includes a lighting system by solar batteries installed on green P roof during the day [designboom.com]. San Diego Multi-tiered parking structure is another helpful example [Morales, D., 2014]. Project 'Eco Cycle Parking', in Tokyo, Japan, where the bike is well accepted as a means of transport. The highlight was the underground parking for over 9000 bikes, by a special elevator in less than 30 seconds [GIKEN, 2008]. Indian designer Abhinav Dapke sketched a thinner bike parking system called Tree Parking Bicycle Parking Stand. His bike rack system also secures bikes using a fingerprint sensor.

Bike Hanger is a vertical bike parking system designed by Manifesto Architecture P.C., temporarily installed in Seoul and London. It holds 20 to 36 bikes. The system is attached to the side of a building so as to not interfere with pedestrian traffic. The construction of the system costs $100,000 but the maintenance only costs $15 a year. The frame of the system is built out of recycled carbon and recycled stainless steel. The system has a canopy made from recyclable bottles [Snellings, M., 2013] (Fig. 10).



Eco Cycle Parking, up & down | Multi-tiered parking structure, San Diego | Green P (Parking) Lithuania, 2009 | Robotic Parking Systems

Fig. 10. Parking solutions as a tool to raise quality of life. Source: [roboticparking.com], [designboom.com], [Morales, D., 2014], [GIKEN, 2008] & [Snellings, M., 2013].

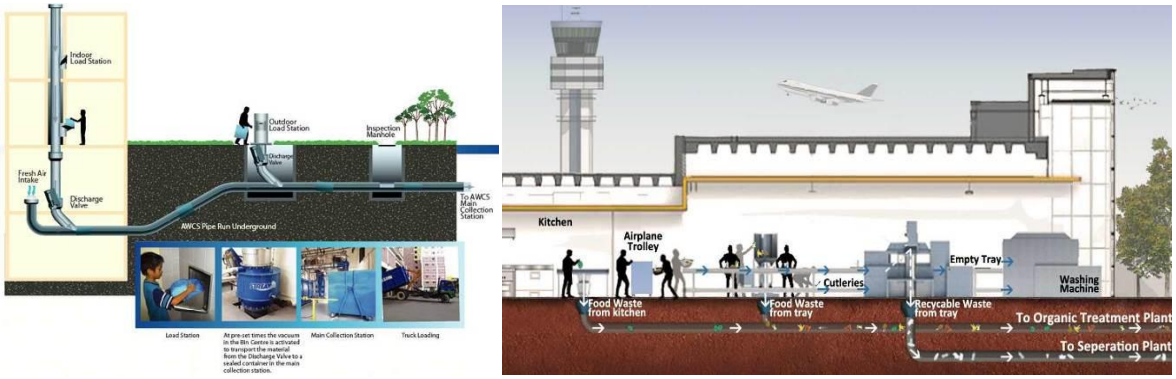
-Waste management principles and architecture: Examples varied in their application of the principles of waste management. Also they varied in design trends, either they used environmental, sustainability, technical and smart architecture, or they used innovative building materials and methods.

- Impact on main indicators of quality of life: they have a variety of Positive effect in main domains of quality of life.

4.4 City Waste Management

There are many infrastructure solutions to be utilized in urban cities. Litter Bin System is only one of those solutions. The system eliminates all the problems associated with regular refuse bins in public places such as, overfilled up bins, rodents, pests and foul odor. It reduces significantly the overall operational expenses of a municipality. Besides that, it also enables enrichment of the environmental aspect of a city. Bins are automatically cleared up by the automated waste collection system. The bin has an indicator sensor that determines when capacity is reached for automated suctioned clearance. The waste is sucked through an underground pipe to a central waste handling facility.

STREAM system is able to help in the transformation of waste to valuable resources, by capturing wet food waste from the source of generation in kitchens and collecting it in containers or delivering it directly to food waste treatment plants. It becomes not only environmentally supportive but also highly operationally and economically sensible for high volume food waste generation industries, such as hotels. STREAM is the next generation green utility infrastructure that is essential for a more populous world requiring sustainable infrastructure solutions [Stream, 2010] (Fig.11].



Litter Bin System STREAM system

Fig. 11. Alternatives of sustainable infrastructure. Source: [Stream,2010].

Artificial Composting Islands be the Future of NYC Sanitation, vision 2020, is a real progress in waste management. New York City produces a lot of trash: over 14,000,000 tons a year, most of which is bussed and shipped out of the city at an annual cost of $300 million and an even higher environmental toll. Architects have begun thinking about a way to reduce waste-related traffic, noise pollution, and greenhouse gas emissions. What they've come up with is the Green Loop, a waterfront hub that has a street-level composting facility with an elevated park on top. The ten proposed hubs stationed along the city's waterways would be "large enough to accommodate anything from educational facilities and neighborhood gardens to cross-country skiing in the winter." Green Loop compost matter could be used to grow local produce [Yoneda, Y.,2014] (Fig. 12).

Fig.12. the Green Loop is a composting hub and park, and part of a larger proposal for a network of ten waterfront-composting hubs in New York City. Source: [Yoneda, Y., 2014]

And there is Masdar city in the United Arab Emirates with its slogan "Zero Carbon, Zero Waste, and Zero Car" [Masdar City, 2011]. The project is planned to be started in 2006 and is expected to finish by year 2020. The project aims to develop and maintain high quality of life will run on various forms of renewable energy. It is expected to have a 60MW solar power station, a 20MW wind farm, and the world's largest hydrogen power and geothermal power plants to power the city. 80% of the used water will be reused as irrigation water for fields and farms. All the biological waste produced by the city will be turned into soil fertilizers and all other types of waste will be burned as yet another source of energy so that no waste ends up getting thrown away as mere garbage. The new city will be convenient for local pedestrian access and a Personal Rapid Transit system [PRT], a type of driverless

cyber car available for longer travel within the city. In addition to Masdar Public Transport: Driverless cars – powered by solar electricity – and guided by magnetic sensors (Fig. 13).

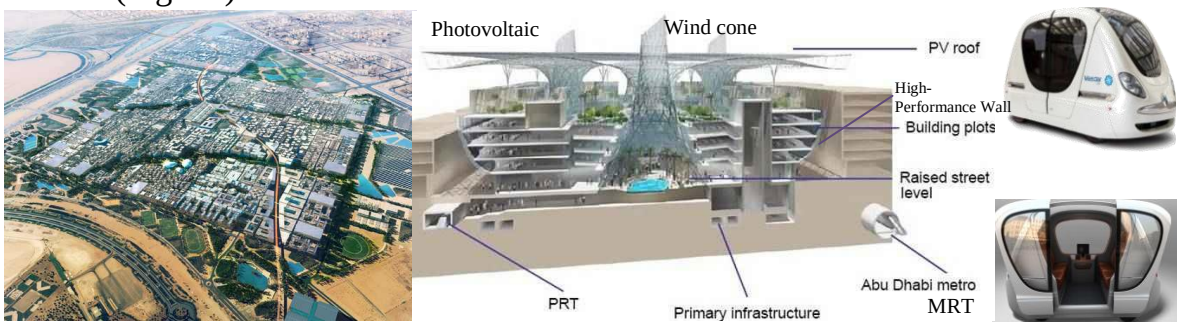


Fig.13. proposed masters plan of Masdar City for high quality of life. Source: [Masdar City, 2011].

-Waste management principles and architecture: At cases of cities or large scale projects, landfill principle will be a main solution. Sustainable architecture is a general trend, it depend on creative structure methods.

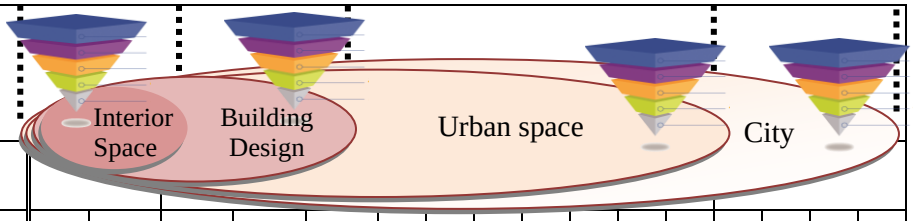
- Impact on main indicators of quality of life: large scale projects have Positive Indicators in main domains.

5. CONCLUSIONS

From the mentioned above analysis, in part one, (Table.1) has shown that most of examples can apply a hierarchical organization of waste management to use it at all design scales from interiors to city planning. Waste Management applications on the cities have a positive and direct impact on the quality of life

The construction industry is one of the most polluting sectors in the world, so architects can play a fundamental role by using waste, ingenuity, to convert it into useful and beautiful structures. The most important challenge when recycling is to keep in mind that reusing the materials should not waste more energy (water for washing, transportation, etc.) than using a new material. Another challenge would be to know the properties of the materials in order to improve their functionality in their new utilisation; this is a concept called “super-use“.

Table.1. Contemporary examples and applications analysis based on Waste Management Hierarchy, Architecture design and Main Indicators of Quality of Life. Source: Author.

Waste Hierarchy																			
Some applications of waste management at design levels to raise the Quality of Life indicator			Mobile Illy Push Button House, US	Holistic Application of Nano surfaces in Interiors	"Mekano" The Seeds of Life Skyscraper, Cairo	Hive-Inn™ City Farm at New York	Trash Beach Hotel, Madrid	Waste Landscape, Paris	Built on top of a mall, Chine	Robotic Parking Systems	Green P (Parking) Lithuania,	Multi-tiered parking structure, San Diego	'Eco Cycle Parking', Tokyo	Tree Bicycle Parking Stand& Bike Hanger	Litter Bin System- infrastructure solutions	STREAM system- infrastructure solutions	NYC Sanitation, composting hubs	Masdar City- the United Arab Emirates
Waste Management Principles	Reduce			■	■	■			■	■	■	■	■	■	■	■	■	■
	Reuse		■			■	■	■	■					■				
	Recycle				■	■		■						■		■	■	■
	Recovery			■	■	■					■	■	■	■	■	■	■	■
	Landfill				■	■									■	■	■	■
Architecture design	Environmental						■											
	Sustainable				■	■		■	■	■	■			■		■	■	■
	Smart		■									■	■	■	■			
	Nano			■														
Building construction	Structure methods		■		■	■			■	■	■	■	■	■	■	■	■	■
	Building Materials			■		■	■	■						■				
Quality of Life	Economic	Direct				■			■			■		■		■	■	■
		Indirect	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
	Social	Direct			■				■	■	■					■	■	■
		Indirect		■		■	■	■	■			■	■	■	■	■	■	■
	Environmental	Direct	■		■	■	■			■	■	■		■	■	■	■	■
		Indirect		■				■	■			■	■	■	■	■	■	■
	Urban	Direct			■	■				■	■	■				■	■	■
		Indirect	■	■	■	■	■	■	■		■		■	■	■	■	■	■

6. RECOMMENDATIONS

- It is necessary to introduce recycled materials building and waste construction management in the Building Construction Code.
- It is necessary that both governmental and non-governmental institutions develop indicator for 'The Quality of Life' like the developed countries and cities all over

the world have done. Advantage of such indicators is to act as a public monitor for the progress made in the efforts of economic growth

- It is significant to spread awareness about waste-management and find how to manage, reduce, recycle, and reuse waste by connecting with all the society.
- We must make rational use of our resources in order to reduce the volume of waste and make good use of waste-based materials as an optimal solution to improve quality of life.
- The study recommends the production of construction materials made from recycled waste.
- There should be specific laws and regulations to control and reduce waste.
- The government should establish an electronic data center to collect and organize information about waste in each area of the country for following up and planning procedures.
- It is useful to use the world best technology in the hierarchy of waste management to raise the quality of life index.

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النفايات بمنظور معمارى كطريق نحو جودة الحياه

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الملخص:
نتيجة للتطورات الاقتصادية والاجتماعية التي حدثت خلال السنوات الماضية ،ظهرت أنماط معيشية جديدة ،مع زيادة متطلبات الإنسان وتنويعها، مما أدى إلى زيادة كمية النفايات المتولدة وتنوعها وأصبحت الحاجة مُلحة لاتباع الأساليب العلمية في إدارة هذه النفايات سواء كان في طريقة جمعها أو حفظها أو في النقل والتخلص منها بطرق سليمة. يتناول البحث دراسة امكانية التعامل مع النفايات من منظور معمارى فى رفع مؤشرات جودة الحياه .ويُناقش البحث هذا الموضوع من خلال محورين ، يتعرض المحور الاول للخلفية النظرية لجودة الحياه ومؤشراتها وعلاقتها بكل من العمارة والنفايات ، بينما يتناول المحور الثاني تطبيقات التعامل مع النفايات فى العمارة، وفى التصميم المعمارى من حيث اتجاهاته كالبيئية والمستدامة والذكية ، ومن حيث تدرج مستوياته من تصميم فراغات داخلية الى تخطيط المدن.

الكلمات المفتاحية : النفايات ،جودة الحياه ، مجالات ، مؤشرات ،العمارة